AUG 19 1940

AUGUST 15
1940

TELEPHONE ENGINEER

MANAGEMENT
ENGINEERING
MAINTENANCE

FEATURES—The Minnesota and Washington Decisions —a Digest . . . B. C. Burden Continues Short Course in Transmission . . . Line & Desk . . . Washington News . . . Estimating Construction Costs (with charts) . . . News

Mr.
Independent
Telephone
Man

Make
your plans
Now
to attend the

44th
Annual
Convention

of the

UNITED STATES
INDEPENDENT
TELEPHONE
ASSOCIATION

to be held

in

CHICAGO

October 15
16
17
18

While much important business is scheduled for attention at this annual meeting –

The EXHIBITS

of the latest
and most modern

TELEPHONE EQUIPMENT

by the various

Manufacturers & Suppliers

will alone be worth your trip –

●

WATCH

TELEPHONE ENGINEER ANNUALLY PUBLISHES THE LARGEST AND MOST COMPLETE CONVENTION ISSUE

for announcements of and invitations to these EXHIBITS in the October Convention number of

TELEPHONE ENGINEER

FOR LEIPSIC, OHIO,
Too—

A LEICH SWITCHBOARD

Jottings for your Memory Book: *Latest count of persons employed in the Independent telephone business amounts to 23,000 men and 37,000 women. A grand total of 60,000. Going into these figures deeper we find each employee has an average of 66⅔ stations under their care. The Bell and its associated companies have a total of 275,000 employees for an average of 62 stations per employee.*

▼

That the Independent industry might analyze the recent decisions of the Minnesota and Washington decisions we commissioned Roland C. Davies, our renowned Washington correspondent, to cover the subject thoroughly and completely. We are proud of the results and call your attention to the story in this issue.

▼

We were under the impression that August was a vacation month. Not so at the Editor's Desk! Letters from old telephone friends in Grand Junction, Ia., Argyle and Austin, Texas, Paullina, Ia. and Orbisonia, Penn. have made the hot days a pleasure. They were nice letters — which probably accounts for this feeling. Quizzicus, the demon question asker, is also getting his full share of letters suggesting new ideas for the manufacturers to work on.

TELEPHONE ENGINEER

MANAGEMENT · ENGINEERING · MAINTENANCE

Vol. 44, No. 8 **AUGUST 15, 1940**

CONTENTS

- Across the Editor's Desk..... 4
- Station Barometer 6
- "Tapping In" on Washington By Roland C. Davies..... 15
- USITA Washington Representative Dies..... 16
- Short Course in Telephone Transmission By B. C. Burden..... 17
- Lon Jester Picnic..... 19
- Estimating Construction Costs Jay G. Mitchell (No. 2 of Series)..... 20
- The Minnesota and Washington Decisions—By Roland C. Davies..... 22
- Convention Dates 23
- Quizzicus Asks Questions..... 26
- Line & Desk—By Ray Blain..... 28
- Long Lines—By R. A. Clark Jr..... 30
- Association Activities 35
- 25 Years Ago This Month..... 39
- Index to Advertisers..... 46

Published Monthly by

Telephone Engineer Publishing Company

A Magazine devoted to the interests of the entire telephone industry—operating men and manufacturers.

SERVING THE FIVE BILLION DOLLAR TELEPHONE INDUSTRY

Founded in 1909

Office of Publication, Pontiac, Illinois. Executive and Editorial Offices 7720 Sheridan Road, Chicago, Illinois. Phone Rogers Park 3040. J. A. SMITH, President and Treasurer; RAY W. SMITH, Vice-President and Editor. Subscriptions: U. S., Cuba, Mexico, $1.00 Per Year; Canada, $1.50; In all Other Countries, $3.00. Single Copies, U.S.A., 15 cents. All Subscriptions should be sent DIRECT to 7720 Sheridan Rd.

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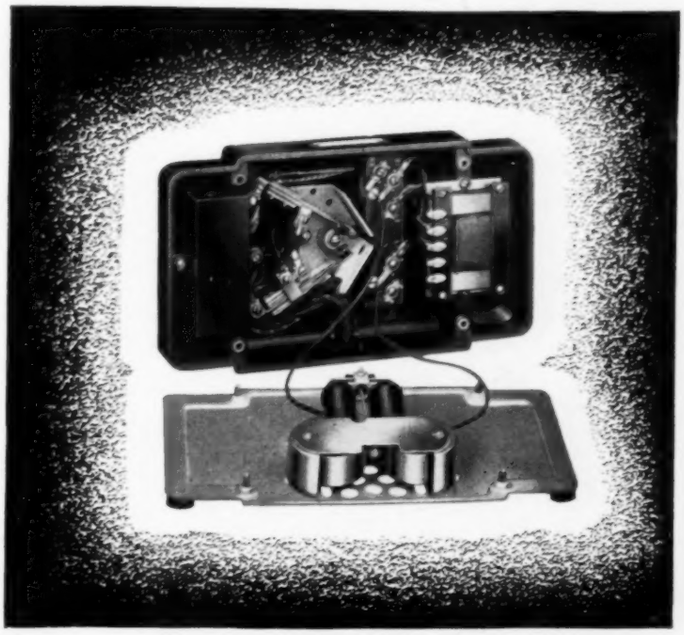
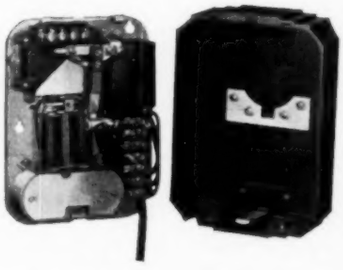
HERE are combination Masterphones, Wall Masterphones and Desk Set Boxes with all parts interchangeable except the condenser. Also these telephones utilize the same all-Bakelite handpiece, the same receiver and the same NON-POSITIONAL transmitter. This is the kind of standardization you have always wanted. Think what this means to you in inventory, investment, maintenance and operating efficiency. Masterphones are your SAFEST bet!



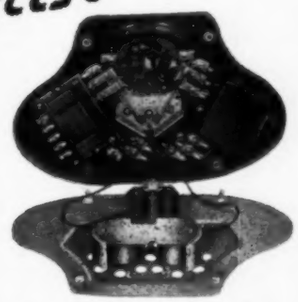
Easy maintenance

Easy access to parts!

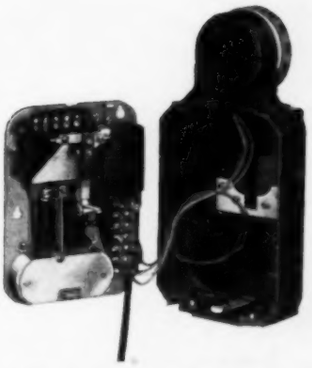
Inside view of 700 type Desk Set Box with Bakelite housing removed.



Interior of 9900 Wall Masterphone showing compact, yet accessible, arrangement of all the parts.



Metal base plate and Bakelite housing of 925 Dial Masterphone. Note the neatness and ready convenience of all parts.



Inside exposed of 9917 Wall Set. The same back plate is used with the 9900 type manual set. Less the trigger switch, it is also used with the 700 type desk set box.

KELLOGG Masterphone

KELLOGG SWITCHBOARD & SUPPLY CO.
6650 SOUTH CICERO AVENUE CHICAGO

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SAVE TIME and LABOR

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ASSURE SECURE ANCHORAGE IN HOLLOW MATERIAL AT LOW LOST

Your construction and service departments will find daily use for PAINE Cadmium plated, Spring Wing Toggle Bolts that are specially designed to speed up installations in hollow walls and ceilings, and to provide dependable anchorage. Wings are easily compressed and automatically spring to holding position when slipped through bolt hole. Ask your supplier for PAINE Spring Wing Toggle Bolts and write for complete catalog of Anchoring Devices, Drills, Cable and Conduit Clamps.

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No Moving Parts • No Vibrating Contacts • No Routine Maintenance • No Radio Interference

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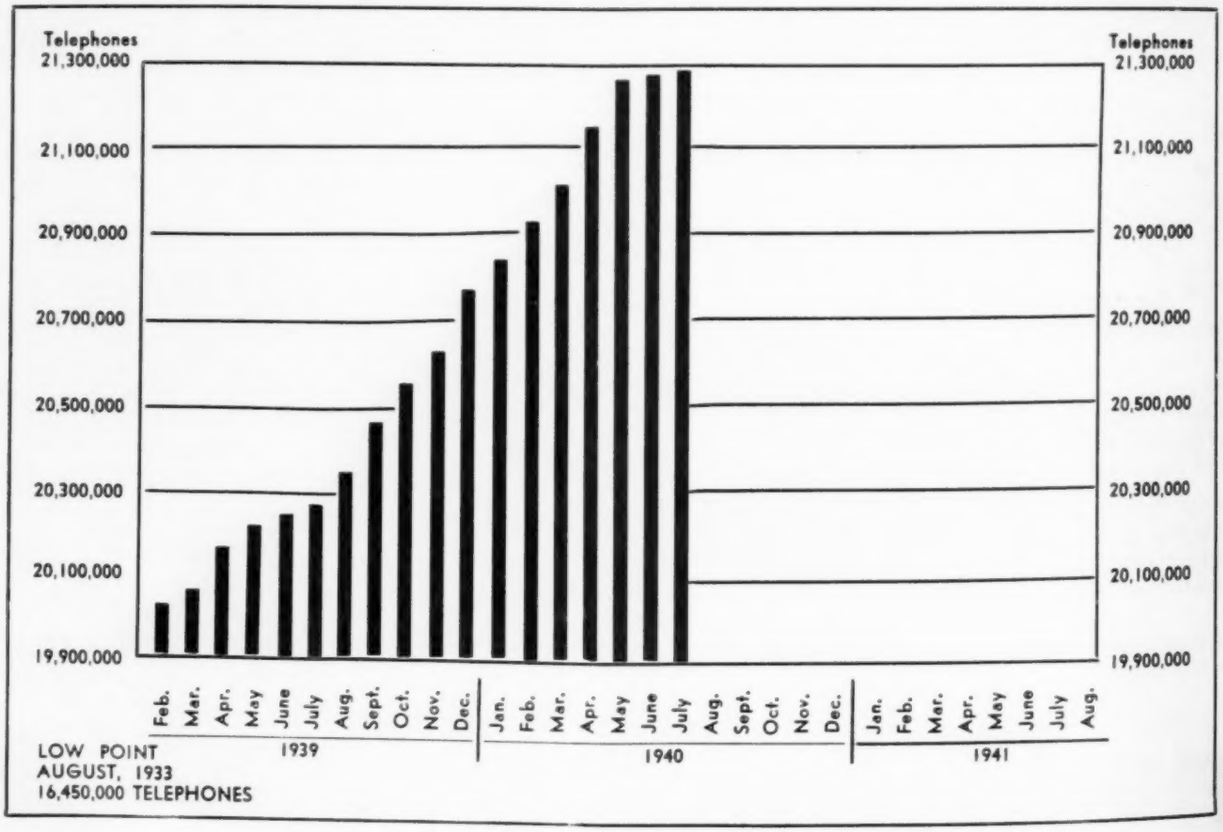
WRITE FOR LITERATURE

LORAIN PRODUCTS CORP., Lorain, Ohio

Monthly Telephone Station Barometer



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scribers are quick to appreciate the superior trans-ion and reception qualities of Stromberg-Carlson 1212 Handsets. They voice their enthusiasm freely n these instruments are installed.

se superior reception and transmission qualities e it far easier for the operating company not only btain new subscribers, but to sell extension service.

is due in a large measure to the receiver and trans-er which are used in Stromberg-Carlson No. 1212 dsets. Each is the development of the famous mberg-Carlson Telephone Acoustical Laboratory. bring to the field of telephony the benefit of knowl-gained in the radio field.

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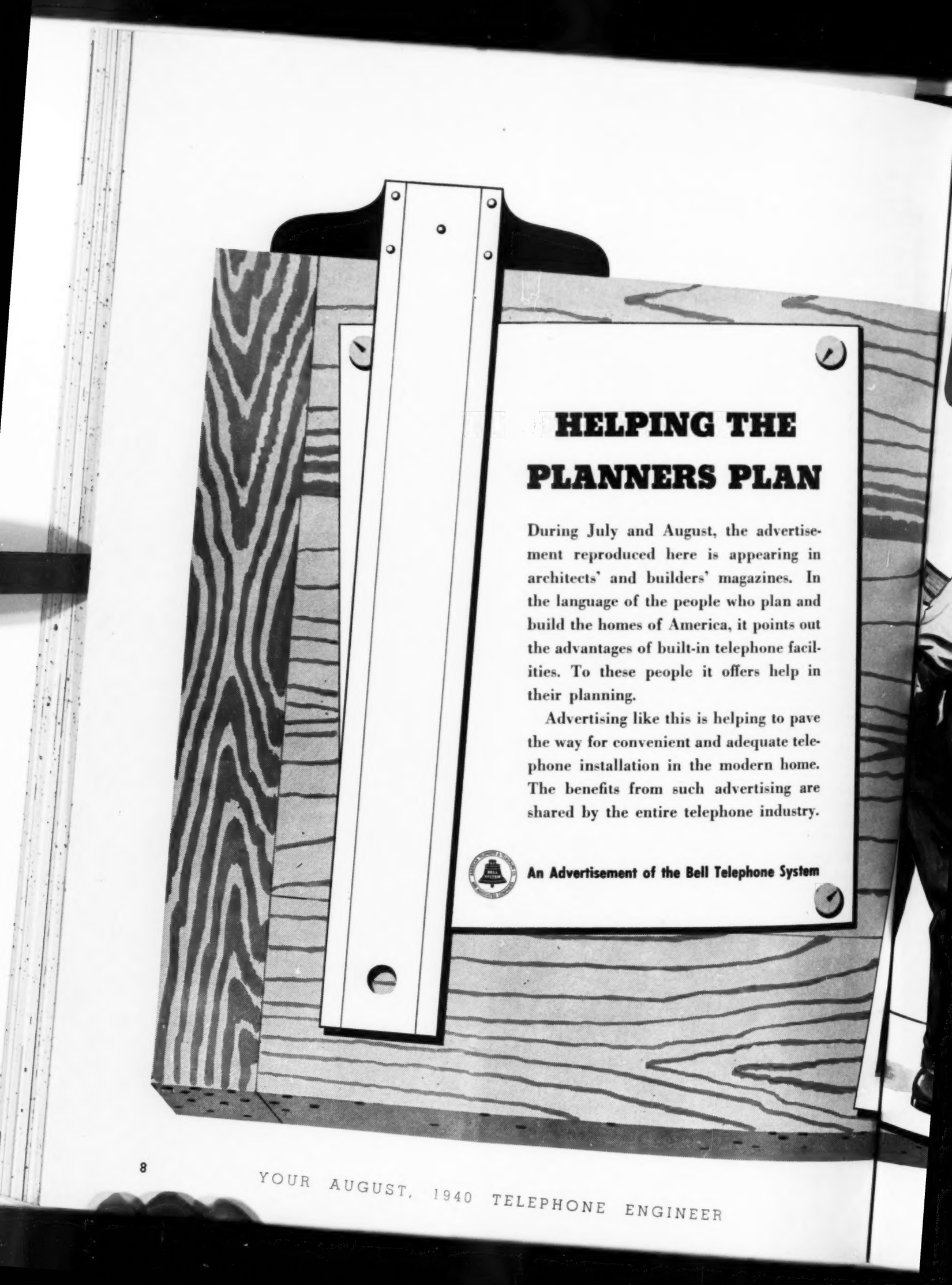
MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR FORTY FIVE YEARS


HELPING THE
PLANNERS PLAN
During July and August, the advertisement reproduced here is appearing in architects' and builders' magazines. In the language of the people who plan and build the homes of America, it points out the advantages of built-in telephone facilities. To these people it offers help in their planning.
Advertising like this is helping to pave the way for convenient and adequate telephone installation in the modern home. The benefits from such advertising are shared by the entire telephone industry.
An Advertisement of the Bell Telephone System

YOU'LL be glad you included telephone facilities in your plans. First, because you know that lovely walls and woodwork will look the way you visualize them—unmarred by exposed wiring. Second, because your clients will appreciate the step-saving convenience of well-located telephone outlets.

While the house is under construction, telephone outlets, connected by conduit, raceways or other built-in arrangements, can be installed very inexpensively. Then there is a clear, permanent path for wires through concrete, fire-stops, insulation and around duct-work.

Every home should have at least one telephone outlet on each floor. And additional outlets in convenient places will come in handy when more telephones are needed in years to come.

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ROCKED 100-MILE AREA . . .

by the time the smoke cleared telephone service was restored

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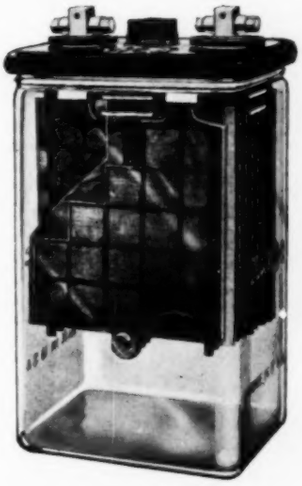
Maintaining normal service with the fewest and the briefest delays, despite accidents and catastrophes of every kind, is part of the tradition that keeps American telephone service the envy of all the world. Playing its own essential part in upholding the same tradition is the equipment on which the telephone companies rely.

There could be no better example than Exide Batteries, with their forty-five-year record of dependability in telephone service. Exides help to maintain the highest standards of quick, clear service. Their tremendous reserve power is always ready in emergencies. Neither fluctuations nor interruption of the a.c. power affects their steady flow of energy.

No matter what the service—common battery, emergency reserve, signal, or P.B.X., in small or large exchanges—you will find that Exides live up to the tradition for which our telephone service is known throughout the world.



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THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

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A complete treatise on telephony

Here are three books that can be obtained together or separately, which give a complete treatment of telephone practice, covering everything from simple fundamentals of telephone science and theory to construction and operation of technical equipment and apparatus used in telephony. Features of these books are the clear, understandable treatment; the simple language employed; and the profuse illustrations with drawings and photographs of actual apparatus and circuit diagrams.

TELEPHONE THEORY and PRACTICE

by KEMPSTER B. MILLER, Consulting Engineer

Theory and Elements, *486 pages, 6x9, 272 illustrations*, $5.00

Gives a simple foundation of elementary theory on which to base the extended discussion of practical phases of the industry in the other volumes. Covers such subjects as the science of sound, multifrequency alternating currents, thermionic emission, etc., and includes a practical treatment of the elemental parts of telephone apparatus, such as coils, contacts, condensers, etc.

AUTOMATIC SWITCHING and AUXILIARY EQUIPMENT

***494 pages, 6x9, 287 illustrations*, $5.00**

Gives a simple and thorough treatment of automatic switching beginning with a discussion of substation dials and exchange numbering plans and extending to a detailed description of equipment and circuits for step-by-step, panel, rotary and all-relay systems. It also covers some auxiliary equipment common to both manually and automatically operated exchanges.

MANUAL SWITCHING and SUBSTATION EQUIPMENT

***439 pages, 6x9, 327 illustrations*, $5.00**

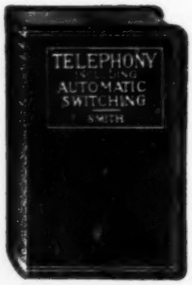
Describes the construction and operation of subscribers' station and central station equipment used in manually-operated exchanges. The treatment is simple, practical and well-illustrated, covering the various types of instruments and switchboards in their entirety and also their component parts. Gives attention to special phases of central-office practice such as theory and practical details of current supply to all lines from a common source, etc.

TELEPHONY

INCLUDING

Automatic Switching

By ARTHUR BESSEY SMITH, E. E.



This book thoroughly covers telephonic speech transmission, with special emphasis on automatic switching, which demand up-to-date treatment. The following brief outline shows the scope of work: The magneto receiver, local and common batteries, instruments, private lines and exchange, multiple and "feature" switchboards, automatic switching and telephone instruments, 100, 1000 and 10,000 line exchange, large city systems, private automatic exchange, power plants, testing and adjustment, toll, phantom circuit, loading of lines, measured service and index.

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Introduces to the Communications Industry

TELE-SPOT

The new machine for locating faults on aerial telephone or telegraph lines, without the necessity of climbing poles or leaving the ground, and in a fraction of the time required by other methods of trouble locating.

Also locates buried cable, water and gas pipes or wiring in the walls of buildings.

Equipment consists of an amplying unit, exploring coil and line tapper, three 40 inch lengths of bakelite tubing, containing wiring to coil and communication lines for line tapper. When these are plugged together it makes a ten foot pole. Additional pole units can be supplied when longer pole is required.

The amplifier contains a loud speaker and the tone is plainly heard without necessity of a head set. Connection is provided so a head set may be used if desired.

Walking under the lines with amplifier hanging from the shoulder, the tone is plainly heard. At the point the tone stops, is the fault. With the amplifier on the seat of your car, the pole on running board, stopping from time to time to hear the tone, enables locating fault at distant points in a minimum of time. This equipment may be used with your present tone generator.

Telkor has also developed and offers as extra equipment, a portable, battery operated tone generator set, this is not included with the TELE-SPOT but is available at an additional price.

TELKOR, Inc., Elyria, Ohio

Buy Tools without "Trial-and-Error" ...the GraybaR way

Because of GRAYBAR'S nationwide service in meeting the tool needs of independent telephone companies, you can get a line on the *practical suitability* of certain tools to specific construction or maintenance problems before you buy. The experience of other users ... available from your GRAYBAR Man ... saves you the time and expense of "trial-and-error."

When you make GRAYBAR your tool headquarters ... you can count on an *all-inclusive* source of supply of tools specifically designed for telephone service, from a completely equipped line construction truck to splicing clamps or crimping pliers. And the fact that GRAYBAR furnishes the supplies on which these tools are to be used – poles, cable, pole line hardware, insulators, conduit and all the rest – means that you get the tools that are *right* for the type of equipment your men are working on.

Doesn't it stand to reason, then, that GRAYBAR is your *logical* source of supply for tools? So why not check with your GRAYBAR Man next time a need arises?

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LINE CONSTRUCTION TRUCKS available completely equipped, with facilities for earth boring, with pole derricks, winches, etc., as required.

DUFF-NORTON Pole jacks, cable reel jacks, pipe pushers – a complete range of types and capacities.

OSHKOSH crowbars, pole supports, peavies, shovels, and barricades.

SALISBURY safety equipment, including linemen's gloves, line coats, rubber blankets, insulator hoods.

Whatever your particular tool requirement, you can get it from GRAYBAR.

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Independent
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Make
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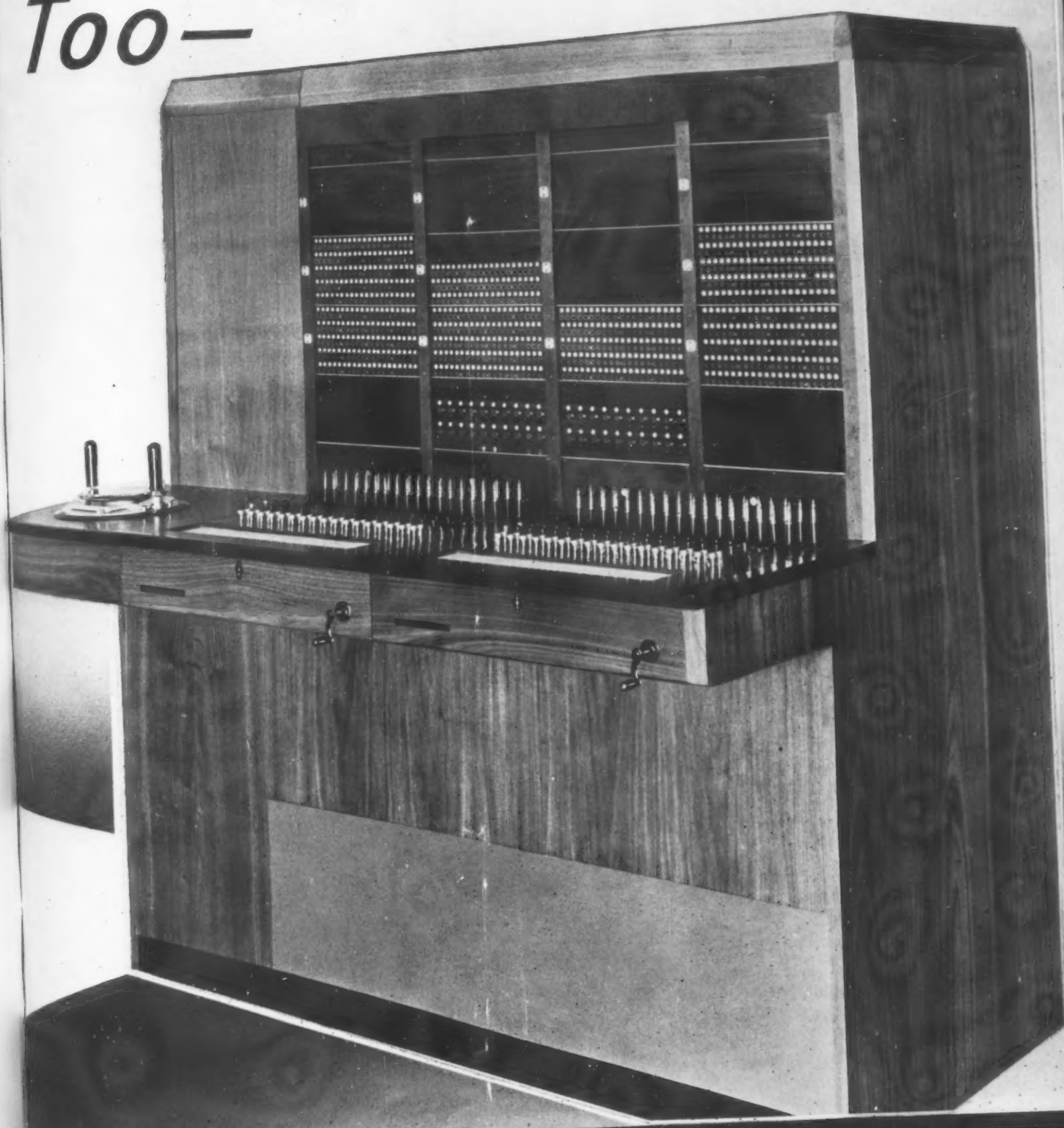

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AUGUST 15, 1940

"Tapping In" On Washington

By ROLAND C. DAVIES
Editor
Telecommunications Reports

THE telephone industry, with the closest sort of cooperation and coordination with the Army and Navy communications officials, has been formulating its activities to fit the needs and requirements of national defense preparedness which will become more intensified in the next few weeks with the passage by Congress of the bills to mobilize the National Guard and Reserve components of the Army and the "selective service" Conscription bill (anticipated at the press time of the Telephone Engineer).

On the basis that with the United States fully prepared in national defense not only will war be avoided but also any aggressor nation can be repulsed, the Army and Navy are laying out most complete plans to perfect the defense organizations in every field so as to meet any emergency that may arise. The telephone industry is naturally one of the vital services in national defense and this advance planning is being directed to gear the telephone service not only in providing personnel and facilities for the armed forces, particularly the Army, but also in mapping out the important telephone functioning and operations for the nation's industries and the home defense of the civilian population.

The Independent telephone industry offered its full cooperation to the national defense authorities when a committee of the United States Independent Telephone Association recently held important conferences in Washington with Major General J. O. Mauborgne, Chief Signal Officer of the Army, and Rear Admiral Leigh Noyes, Director of Naval Communications. The committee which is the authorized defense committee of the Independent Telephone Association, was composed of J. F. O'Connell, Association president and head of the Commonwealth Telephone Co. of Madison, Wis., E. C. Blomeyer, Vice-President of the Theodore Gary & Co., John H. Agee, Vice-President of the Lincoln, Nebr., Telephone and Telegraph Co. and Louis Pitcher, Association Executive Vice-President. The conference with General Mauborgne dealt with the Signal Corps personnel requirements and the need for facilities to be furnished by the Independent industry for the various encampments—the existing ones to be enlarged and the new ones to be built—and for the large number of new Army air fields. The Navy requirements are principally for telephone service and facilities to be needed at new naval bases and aviation centers.

THE mobilization of the National Guard and the Army Reserve after Congressional approval will swing the Army Signal Corps defense program into action—at present it has been, except for the intensification of the training of the present Regular Army and Reserve personnel on active duty and the securing of needed apparatus and equipment, in the status of advance planning. The Bell System and the American Telephone and Telegraph Co. have geared their operations and facilities to the national defense needs in the highest form of completion and perfection as possible. For months and practically for a year the A.T. & T. and Bell System have been engaged in the advance planning for defense with complete cooperation and coordination with the Army Signal Corps and Naval Communications. This planning in advance has placed the telephone industry, it is viewed by governmental defense authorities, in the rank of being probably the best prepared industry from a national defense viewpoint of any field of activity in the country.

There are many phases in the national defense preparedness appearing on almost every front of telephone industry operations. These various developments can be outlined as follows:

1. **The telephone manufacturing industry is receiving a large influx of contracts from the Army and Navy. Some of these range into huge allotments, such as the recent grant of approximately $2,000,000 for telephone cable to the Graybar Electric Co.-Western Electric and many large orders to the leading Independent telephone manufacturing companies, including Automatic Electric, Kellogg Switchboard & Supply Co. and Stromberg-Carlson Telephone Manufacturing Co.**

2. **Plans for the prevention of sabotage by "Fifth Columnists", formulated by the Federal and State law enforcement authorities, which call for special protection of utilities, including the telephone service, and for the establishment of special guards and home defense units for these vital services.**

3. **The training of telephone workers for Army Signal Corps duty is being given most important attention by the Army officials. Emphasis is being laid to a considerable extent upon the training of personnel to handle automatic or dial systems in maintenance and repair activities and the Signal Corps has called upon the Automatic Electric Co. to aid in this training program.**

4. **The question of additions to telephone plant because of national defense requirements is a matter which may be brought to the front in the future legislation in regard to the amortization of the cost of defense facilities. This is an important phase for the industry to have clarified because of**

future rate base aspects when normal times return.

Speedy Congressional action is anticipated in regard to the bill to permit wire-tapping by the Federal Bureau of Investigation to prevent espionage and subversive activities. The House took quick action on the measure and the Senate is anticipated to follow in completing enactment of the measure. Up to the present the Justice Department has not formulated a formula for the conducting of the wire-tapping, but it is anticipated that formal affidavits by the Attorney General will be furnished the telephone companies when wire-tapping is used to complete the arrest of alleged "Fifth Columnists".

FCC Again Presents Proposal for $142,00 Fund to Expand Telephone Regulation

IN A surprise move, because its request for additional funds to enlarge its telephone regulatory activity had been rejected in two previous appropriations measures, the FCC again presented to the House Appropriations Commitee its plea for a $142,000 fund to establish a special telephone rate and research section. The Commission brought up this telephone regulatory allotment in an executive hearing of the House Committee on the first supplemental civil agencies emergency appropriations bill which wil probably be the final regular appropriations measure to come before Congress just prior to adjournment.

Commissioner Paul A. Walker outlined to the House Committee what use and program would be made by the FCC if the $142,000 allotment was approved. It was stressed that the FCC could undertake a more concentrated investigation of telephone rates, could study the complex question of depreciation and could make an inquiry into telephone manufacturing costs.

Telephone Industry Seeks Clarification of Wage-Hour Definitions on Exempted Employees

THE Independent Telephone industry, both manufacturing and operating, presented views at a recent hearing before the Wage-Hour Division seeking clarification and some broadening of that agency's proposed definitions on "executive," administrative, professional and outside salesmen" types of employees to be exempted from the maximum hours provisions of the Fair Labor Standards Act, but spokesmen for Labor Unions in the communications field offered a general counter-attack to any revision of the definitions on the ground that it would exclude additional employees from the benefits of the law.

A. L. Funke, secretary of the Automatic Electric Co. and its affiliated companies, including the Automatic Electric Sales Co., gave the principal presentation for the telephone industry at the two-day hearing. He described the proposed Wage Hour definitions as "too limiting" and "in certain cases producing incongruous results," and cited that the projected definitions completely miss people who are employed in a staff capacity as distinguished from a line capacity. In his group of companies he noted that there were persons with salaries of $4,000 and $5,000 a year who, because they do not have the power to hire or fire or directly super-

(Please turn to page 36)

USITA Washington Representative Dies

William L. Bruckart

WILLIAM L. BRUCKART, Washington representative of the United States Independent Telephone Association and well-known newspaperman and columnist, died suddenly August 4, when he was stricken with a heart attack while playing golf.

Although Mr. Bruckart had only been the Washington representative of the Independent Telephone Industry since last February 1, he had been of great assistance in handling the affairs of the industry and its national association in the National Capital. Just before his sudden death he had participated in the national defense preparedness plans of the Independent industry, having attended a meeting of the Association's Defense Committee in Chicago, July 31 and accompanying the committee to Washington for its conferences with the leading Army and Navy officials in the communications field. He had also performed excellent service in presenting the position of the U. S. Independent Telephone Association at several Wage-Hour proceedings and in connection with congressional legislation, especially the tax measure affecting long distance excise levies.

At the funeral of Mr. Bruckart which was held August 7 in Washington, Louis Pitcher, Executive Vice President of the U. S. Independent Telephone Association, represented the Independent Industry and among the floral tributes were included those from the directors of the Association and President J. F. O'Connell. Among the honorary pallbearers at his funeral were Senator D. Worth Clark of Idaho, and Representatives Cochran of Missouri and Halleck of Indiana. Stephen T. Early, Secretary to President Roosevelt, was a member of the National Press Club Committee which represented that organization at the rites. Roland C. Davies, Washington correspondent of TELEPHONE ENGINEER, was a member of the National Press Club Committee at the funeral.

Mr. Bruckart, who was born in Leton, Mo., was 48 years old. After attending William Jewell College at Liberty, Mo., he entered newspaper work and was associated with the Wichita, Kansas, Eagle and the Kansas City Star. He came to Washington in 1917 with the United Press and later worked for a number of years with the Associated Press. He also was a leading staff member of the United Stats Daily, now the United States News and wrote special articles for the Philadelphia Public Ledger. In recent years he has been the author of a column, "Washington Digest" for the Western Newspaper Union which appeared in nearly three thousand weekly papers throughout the country.

Short Course in Telephone Transmission

By
B. C. BURDEN

Transmission Data for Telephone, Wire, Cable and Apparatus

General

IN ORDER to be able to design telephone systems or to modify an existing system one must be familiar with the transmission characteristics of telephone open wire and cable circuits, as well as telephone apparatus. A knowledge of the transmission losses to be expected from various types of telephone plant is useful though not an absolute essential on the part of those who maintain telephone plant.

Like many other phases of telephony it is possible to "get by" without a good understanding of transmission but those that are fully informed on all types of telephone work are generally the most efficient and capable.

In this article an attempt is made to discuss in as non-technical a manner as possible the transmission losses inherent to various types of telephone plant and the practical significance of these losses in the talking circuit.

Method of Expressing Losses

TRANSMISSION losses, or equivalents, as they are often called, are usually stated in decibels. The decibel, it will be recalled from our previous article, is a logarithmic ratio, and represents roughly the same voice frequency loss as 1.0 mile of No. 19 gauge cable.

If losses (or equivalents) are to have significance we must have transmission standards which specify the maximum allowable losses that should exist on a telephone circuit and still permit satisfactory communication over the circuit.

It was customary for many years to consider any circuit whose maximum overall loss did not exceed 30 db as being suitable for a toll connection, and any circuit whose overall loss was not greater than 20 db as satisfactory for local calls. In other words, it was considered desirable to provide a somewhat better talking circuit for local than for toll calls. In recent years there has been an effort to improve toll circuits, so that but few circuits are now operating at the maximum loss of 30 decibels.

The Standard Reference System

IN CONSIDERING transmission equivalents we must not lose sight of the fact that when we say that our maximum overall loss must not exceed 20 or 30 db (local or toll) we mean that the circuit losses plus the efficiency of the subscribers sets must not exceed these limits.

Now it is perfectly feasible to express the loss of a telephone circuit, or a repeating coil in terms of the loss which a 1000 cycle (represents average voice frequency) current would encounter in passing through the circuit or coil and such loss could easily be determined by measurement, if desired. But it is not so easy to express the transmission characteristic of the subscriber's set, and in fact our transmission problem is made quite complicated when we get the subscriber's set into the picture.

The reason for this can be appreciated by considering how the transmission standards were originally established.

Realizing the necessity for standards of transmission, one of the large operating groups many years ago set up what became known as the **"Standard Reference System."** This consisted essentially of two subsets connected together through an artificial cable line. The efficiency of the subsets was such than when thirty miles of cable was cut into the circuit the resulting transmission path was such that a person talking in a normal tone on one telephone would be heard satisfactorily on the other (toll standard). These particular subsets may then be regarded as having zero loss, and all other subsets will therefore have either a greater loss, if less efficient, or a gain in transmission, if more efficient.

For example if the standard reference instruments, which we will refer to as type A, are less efficient than say a new and improved instrument which we will refer to as type B, then we could actually stand more than 30 miles of cable between the two subsets without exceeding the overall limits fixed by this early standard reference system. What this means practically is that instrument efficiency must be taken into account in designing telephone circuits and systems.

Tables of Transmission Equivalents

In considering common battery plant design from a transmission standpoint, we must add up all of the transmission losses, including, the loss in the central office apparatus, the trunk cables, the exchange cables, and at the same time take into account the efficiency of both the transmitting and receiving telephones. Unfortunately, we cannot do this in a simple straightforward manner because of the subsets. The actual loss or gain imposed on our overall loss computation by the transmitting and receiving subsets in a common battery loop will depend first on the efficiency of the sets under comparison with our "bench mark" subsets in the standard reference circuit. The loss will also depend on the amount of current which reaches the transmitter from the C. O. battery and this will in turn depend on the resistance of the cable pair between the C. O. and the transmitting telephone. The loss of a subset when connected to a cable pair will also vary with the degree of mismatch between the impedance of the subset and the impedance of the cable.

From this it is apparent that we will need curves or charts showing the transmission equivalents of the subsets, when used with various gauges and lengths of cable.

Such tables are not generally available in the Independent field, hence, some difficulty results in engineering cable extensions without this necessary data.

Voice Frequency and Reflection Losses

IN DESIGNING telephone circuits so as to meet definite transmission standards one should have a proper understanding of the several types of losses that go to make up the overall loss of any transmission circuit. These losses may be listed as follows:

1. Gain or loss of subset as compared to the standard subset.
2. Current supply loss to subsets of the C. B. type.
3. Voice frequency loss in circuit.
4. Voice frequency loss in C. O. apparatus.
5. Reflection loss due to any mismatch in impedances.

We have already discussed the first two losses and explained that they can only be determined by curves or charts which cover the specific subset under consideration. Let us examine the last three types of losses. First, voice frequency losses.

It is customary to express the transmission efficiency of a telephone circuit in terms of its losses at 1000 cycles, inasmuch as the loss at 1000 cycles is representative of the loss at the frequencies used in telephone conversation. The voice frequency loss of a unit of apparatus or a telephone circuit can easily be determined from tables such as Table No. 1 shown below. By multiplying the number of units of apparatus or miles or circuit involved by the loss as taken from the table the voice frequency equivalent is readily obtained.

For example if we have a circuit containing say 10 miles of No. 12 iron metallic circuit and two repeating coils we can from the table determine the loss for each coil and for one mile of No. 12 circuit and then by simple multiplication determine the total loss, (i.e.)

10 miles No. 12 iron @ 0.3 db=3.0 db
2 repeating coils @ 0.25 db=0.5

3.5 db

It will be recalled from a previous article on the decibel that a loss of 3.5 decibel would mean that telephone voice currents in passing through a line with losses aggregating this amount would be reduced to 66.8% of their initial value.

Reflection Loss

WHILE the principal component of the overall equivalent on any telephone circuit is the voice frequency loss there is another component which will contribute some loss, and which should in all except rough computations be given consideration. This is the reflection loss which results from the inevitable mismatch in impedances which occur in telephone systems.

Whenever two unlike impedances are connected together, as for example, a 700 ohm subset and a 500 ohm line part of the energy reaching the subset from the line will be reflected back toward the distant end of the line, and this effect creates a definite loss that must be added to the overall equivalent of the line.

The greater the ratio of the two unlike impedances the greater the reflection loss.

In ordinary transmission computations the reflection loss is ignored, however, in the Tables previously referred to and which give the losses for subsets and various types of loops when associated together, the reflection loss is included.

Loss Due to Bridged Taps and Ringers

IN computing subscriber to subscriber transmission equivalent one must take into account, not only the cable between talking and receiving telephones but also any bridged cable which may be connected to the same line. In order to make a cable plant as flexible as possible considerable use is made of multiple terminals. When a branch cable is multiplied with a main cable the multiple cable acts much the same as would a capacity connected across the talking pair, hence, results in an increased transmission loss over what would exist were the bridged tap not present.

The magnitude of the loss which a tap will introduce on a talking circuit will depend upon the distance between C. O. and the distant telephone, and the distance to the point at which the bridge tap is made, and of course the length of the tap. No simple formula is available for computing a bridged tap loss. The larger companies have tables available for determining this loss.

To give some idea of the loss resulting from a bridged tap, let us take several practical cases.

Assume we have a 5000 foot tap on a 10,000 foot loop with the tap at the

(Please turn to page 39)

Fred C. Goodwin Named By Rochester Tel. Corp.

Fred C. Goodwin

At the regular meeting of the Board of Directors, held on Friday, July 26, Mr. Fred C. Goodwin, Jr., was elected Treasurer of the Rochester Telephone Corporation to succeed Mr. Charles M. Beattie, deceased.

Mr. Goodwin has been with the Rochester Telephone Corporation since August, 1923, when, following studies in business administration at the Wharton School of Finance, he took a routine position in the commercial department.

After broadening his experience in other departments, Mr. Goodwin was appointed assistant to John P. Boylan, President of the Corporation, in 1933.

In October, 1934, he was elected secretary to succeed the late William J. O'Hea.

This latter promotion for Mr. Goodwin combines the office of Secretary and Treasurer.

Mr. Goodwin is the son of Mr. Fred C. Goodwin, senior member of the firm Goodwin, Nixon, Hargrave, Middleton and Devans.

Lon J. Jester Picnics Midwest Company

BRIGHT and early, Saturday morning, August 3, employees of the Midwest Telephone Company and guests of its genial vice-president and general manager, Lon J. Jester, began arriving at beautiful Golden Lake at Oconomowoc, Wisconsin. The big day of the year had arrived. Lon's annual picnic can better be described in the actual words of one of his guests, "When Lon throws a party everyone invited comes and everyone has a swell time".

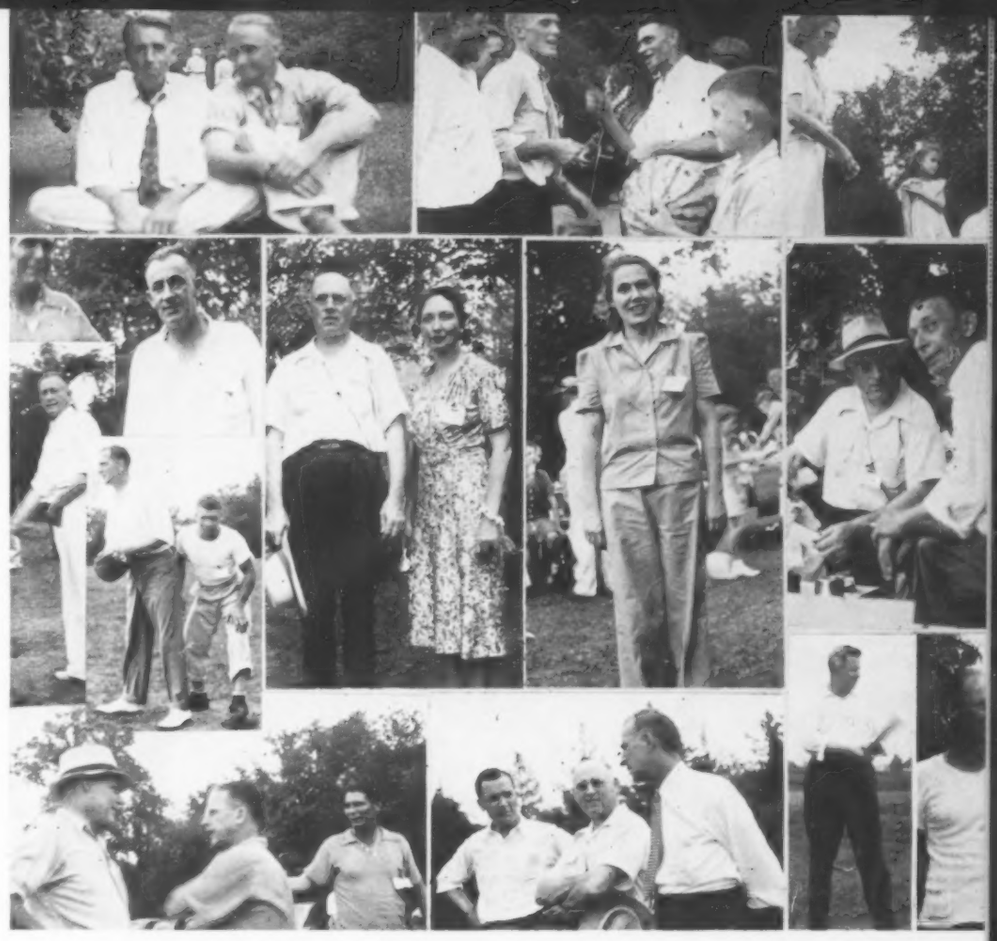
Even the cloudy skies and the rain filled clouds failed to keep the attendance down and with rain falling intermittently throughout the day it also failed to dampen the ardor of those present.

Swimming, boating and contests filled an all too short day. During the morning a soft ball game between the femmes present kept Leich Sale's Faulhaber, the umpire, in hot water. His way with the fair sex however kept him from losing the balance of his curly blonde locks.

Then came the picnic lunch . . . served as an embryo barber shop quartette struggled through their hastily arranged but fitting program. And what a lunch, much too much to describe it justly but climaxed with scores of good old home made chocolate cakes, watermelon and ice cream. The contest overlooked, which would have been a dilly, was a knife and fork contest between the following managers of Midwest exchanges: H. G. Culver, Oakfield; John Schlosser, Richmond; Guy Loftus, Wilmot; A. J. Sukawaty, Cambellsport and Kewaskum; Lyman Gilliland, Winnebago; and those hearty exponents of expense account dining; McGillis & Gibbs' Jim Naugle, Kellogg's Marty Bellion, Stromberg-Carlsons' Pete Winemiller and W. J. Pfaender; and Automatic's Stan Sherman and Ralph Engsberg. What an eating contest those two teams would put on and there wouldn't have to be much of a prize as a lure.

AFTER lunch came the featured event of the day, a ball game between the linemen and the salesmen. . . . The latter took an early lead and had the game seemingly in the bag until the last inning. Stopping to give umpire Winemiller a bucket of refreshments, the peddlers went into a huddle and decided to remove pitcher Eldridge and changed their line-up in several spots to repel the final onslaught of the linemen. Bang—Bang—Bang—four runs and the linemen again had the scalps of the peddlers before they or Umps Winemiller could get back down to earth.

Following the ball game attendance prizes were awarded the lucky ticket holders and as the sun was setting there were many aching bones among the would-be athletes and a score of shiny albeit sun-burned noses among the fairer sex. Mr. and Mrs. Jester, the hosts are to be complimented on such a swell picnic. Miss Barbara Barrick, secretary to Mr. Jester must not be overlooked in passing out the bouquets as she was everywhere at once making everyone feel at home. . . . TELEPHONE ENGINEER'S hired hand hopes to be on the invitation list again next year.



(Top row) Left to right—W. E. Meyer, and Jim Welborn, managers of Midwest Tel. Co. in Fon du lac and Lomira, Wisconsin, respectively; this group of employees of the Midwest were aptly nicknamed the "barber shop quartette"; the next picture shows the drawing for attendance prizes. (Second row) N. R. Marchant and Art Kruger, Midwest construction foremen; Mr. and Mrs. Lon J. Jester—the hosts; Miss Barbara Barrick secretary to Mr. Jester; Mr. Lester talking to Kellogg's Chas. Reese. Inset left: Frank Eledridge at bat—"Old Reliable" Win Rodormer and one of Midwest's linemen at first base. (Third row) Stromberg-Carlson's Umpire Deluxe, Pete Winemiller arguing with Marty Bellion of Kellogg, Captain of the peddlers team and Slim Marchant, Captain of the linemen ball team. It seems that Pete is holding his own; again Rodormer and Jester jawing at Leich's Sale's Faulhaber; "Slugger" George Morris, another Reliable standby and M. H. Hudson Midwest's Manager of the Byron, Stillman Valley, New Bedford and Cherry Valley, Illinois, exchanges.

E. C. Blomeyer Heads Depreciation Committee

Due to a study being made by the National Association of Railroad & Utilities Commissioners of depreciation practices of public utilities, President O'Connell of the United States Independent Telephone Association has deemed it advisable to appoint a Depreciation Committee to cooperate with the above-named committee, that the ideas of the Independent industry might be given full consideration. The members, most of whom served as members of the previous Depreciation Committee, are:

E. C. Blomeyer, Chicago (Chairman); J. P. Boylan, Rochester, New York; Carl Brorein, Tampa, Florida; Ranford Dunlap, Ft. Wayne, Indiana; Gustav Hirsch, Columbus, Ohio; A. N. Johns, San Francisco, California; H. W. Pike, Madison, Wisconsin; H. H. Wheeler, Jr., Lincoln, Nebraska.

California Association Has New Office Address

Opening a new office at 1030 Bay St., Santa Monica, the California Independent Telephone Association goes on a full time basis since its new secretary, R. E. Bennett, will now serve in full-time capacity.

The Author

ESTIMATING Construction Costs

By JAY G. MITCHELL

Here, in the second article on "Estimating Construction Costs" the author presents a concrete illustration of the method of employing Labor Relatives in a simple estimate of pole cost. Labor and Material loadings are illustrated and discussed so that the adaptation of this modern method may be understood readily.

THE operating engineer who is confronted with the routine task of compiling construction cost estimates will undoubtedly have cost notes which experience has shown will develop construction cost estimates which are accurate. In many such collections of cost data, however, the several component elements, while they may and undoubtedly do produce reliable overall cost estimates, will be found on analysis to be inaccurate in their allocation to specific details. Prior to the necessity for exact accounting in plant retirements, essential in Continuing Property Records, this was not a matter of great importance. With more exact allocation of all construction costs as an essential to accurate book figures for individual plant accounts it appears that methods of cost estimating may be greatly refined so that loadings and direct costs are logically distributed. For this purpose the development of data to provide a complete tabulation of labor relatives should be inaugurated while current construction estimates are passing through the several stages between approval and final work reports. This is because completed estimates afford, for any given organization, the most reliable means of proof testing labor relatives and loading per cents.

An illustration of the use of methods which provide satisfactory estimated costs, in the aggregate, but unsatisfactory and inaccurate detail cost distribution may be cited from the experience of the author. In connection with the appraisal of a large property it was necessary to check certain details of the construction estimates for pole line construction currently submitted for executive approval. It was found on examination that in the estimates covering pole lines all labor had been included on the basis of an overall average hourly rate of $1.00 per hour. As a matter of actual fact the weighted hourly rate for the class of construction labor involved, in the organization in question, was $0.596 per hour at that time. The importance of this illustration lies in the fact that the use of an hourly rate for labor of $1.00 without identified loadings happened, by coincidence, to produce labor cost **totals,** for pole lines, which were in accord with experience. This practice did not, as to details, properly reflect accurate distribution of costs between units of plant nor the loading components of the cost. In other words as far as the matter of fixing accurate retirement costs is concerned such a procedure necessitated the use of some scheme of averaging book figures for retirement units. In this particular instance the use of a rate of $1.00 per hour in computing estimated labor costs of pole line construction **happened,** apparently, to properly load the actual hourly rate, in fact, so that it corresponded, in the construction of current pole line projects, with actual experience. There is no disposition, of course, to depreciate the use of short cut methods whenever possible. The thesis is rather one of insistence upon accurate distribution of all construction costs. In order to bring this about the conservative engineer will set about developing and proof testing a schedule of labor relatives while continuing the use of such approximate overall methods as may not yet be superseded by the development of accurate data .

Labor Loadings

IT is obvious, on the slightest consideration of the matter, that the cost of the direct labor in any construction project is bound to be less than the total labor cost. The difference between the total amount of money that must be expended by the company through the payroll on a given project and the amount accounted for by the total number of direct man hours applied in the construction of units of plant represents the amount of loading that must be added to direct labor costs in order to determine the estimated total labor cost. It may be well to define direct labor costs as the sum obtained by extending the total man hours into the rate per hour for each class of labor and combining the results into a total for each unit of plant. An illustration of the computation of direct labor is found in the computation of the labor cost of a Class 4 Western Red Cedar pole on page 18 of the July number of TELEPHONE ENGINEER. It is the cost of the labor, aside from supervision costs and indirect items, which on the average adheres to one such pole and it is of a surety bound to be increased when the hole for the pole has to be made in rock and will be lower when the hole for the pole has to be made in ordinary easily moved loam. The company, however, which made up an estimate for a Class 4 twenty five foot Western Red Cedar Pole Lead using the man hours shown (page 18 July TELEPHONE ENGINEER) would

find that the labor or payroll cost assignable to the completed lead was much in excess of the estimate. The discrepancy would be the Labor Loadings which must be incurred in the project but which are not directly identified with the poles. Labor loadings are determined by organization efficiency, locale, topography and other factors which make them different in different companies except through coincidence. Loadings, however, in any case falls within certain rather narrow limits and when these limits are known they afford a rough means of checking against error. As an illustration of the method of including labor loadings in the computed cost the following simple illustration from the personal experience of the author is given on this page.

The above example is cited for illustrative purposes only and is not to be understood as representing a correct unit cost except in the place where it was originally used. As an illustration it will serve to provide a basis for a discussion of the method to be used in estimating construction costs by employing a system of labor relatives.

The Labor Cost

In the illustration the unit cost of the 30 foot Creosoted Yellow Pine pole is shown as it enters into the estimate. In other words the total cost shown, $18.864, will either be fully sustained by the final experience total cost of this kind of pole after the construction has been completed or it will be found to be too low or too high. The conservative engineer will carefully check the record of the completed project for the purpose of developing possible error in the labor relatives or labor and material loadings used in the compilation of his estimate. Should it happen that the cost of the completed project is found to be in accord with the estimated cost and the results, that is the labor relatives and loadings may be tentatively accepted for future use in estimating the construction cost of this kind of pole set in the same kind of soil and under the same conditions. Once computed and then verified or revised, as the case may be, the relatives and loadings become the basis of future estimates. The same procedure may well be followed as a current activity until construction cost data for all units of plant becomes thoroughly seasoned and accurate.

In estimating the construction cost of telephone plant there are a few items that may be added to the total computed costs to cover the elements of total cost which may be designated as General overheads. Such items are Insurance During Construction and Interest During Construction. These two items are unavoidable, that is they must be included in the cost of all the operations of the company, and are properly added to the estimate project totals rather than to the individual unit costs because they are based upon the total cost of plant. When included in the estimated cost in this way these two elements of the cost may be shown in the form of a Per cent. of the total cost.

UNDER the labor items it will be noted that the labor relatives are so arranged that the man-hours to which each hourly rate of pay is to be applied are segregated. For instance the men who unload and pile the poles are receiving, in the illustrated unit cost computation, $ 0.603 per hour while the men charged with the digging and erecting and with driving the truck are receiving $ 0.637 per hour. These are weighed averages. It will also be noted that the labor loadings shown amount to $ 4.185 which is added to a direct labor cost of $ 6.085, amounting to an overall loading for labor of 69%. It will be asked why the detail in computing the labor loadings when the same result will be obtained by using the overall Per Cent. of 69 added to the direct labor. The answer to such a natural inquiry is that when the computation is to be made for some other unit of plant, such for instance as crossarms, the loading Per Cent. for Plant Supervision, for illustration would not be the same as it would be in the case of Pole Lines. The basic idea in the use of labor relatives is to define the average man hour requirement for each unit of plant because it is thought that skilled men carrying out the same construction operation with the same methods and under the same circumstances will require the same number of man hours for its execution. Other elements of cost which must be incurred by the company doing the work, such as Engineering, are directly related, for any given company, to the direct man hours but **may or may not be in the same ratio** to the direct

(Please turn to page 42)

Unit Cost of 30 foot Class 4 Creosoted Yellow Pine Pole in place in plant

Labor—30 foot Class 4 Creosoted Yellow Pine Pole			
Unload and Pile	.376	Man hours @ $ 0.603	$ 0.227
Haul	.650	" " 0.542	.352
Digging and erecting	8.230	" " 0.637	5.243
Truck driver	.370	" " 0.637	.236
Total Direct labor	9.626		$ 6.058
Labor Loadings			
Plant Supervision	10.25%	of Direct labor	$ 0.621
Incidentals	26.30%		1.593
Engineering and Engineering Supervision	5.80%		.351
Vehicle and Other Tool Expense	26.80%	(1.75 truck hours per)	1.620
Total Labor loadings		(10 Man hours labor)	$ 4.185
Total Labor Cost			$10.243

The total cost of this pole was found to be as follows:

Material (pole		$ 6.450
Freight		1.400
Subtotal		7.850
Construction Loss	100%	.080
Subtotal		7.930
Supply Expense	3.40%	.270
Total Material		$ 8.200
Total Direct Cost (Total Labor plus Total Material)		$18.443
Overheads		
General Expense, Auditing and Administration	1.30% of Total Direct Cost	$ 0.240
Workmen's Compensation	2.50% of Direct Labor	.151
Public Liability	0.50% of Direct Labor	.030
Total Unit Cost		$18.864

The Minnesota and Washington Decisions

By ROLAND C. DAVIES

Although many telephone men have been informed of the decisions herein mentioned, the Editor is of the opinion that the interpretative writing of Mr. Davies will perhaps give you a clearer view on what these decisions mean to you and your company. We urge you to read every word of this report.

IN its opinion affirming the discretionary powers of the Minnesota Railroad and Warehouse Commission in fixing public utility rate schedules, the Minnesota Supreme Court has upheld that state regulatory body in its May 2, 1939, modified rate reduction order regarding the telephone rates in St. Paul and Minneapolis and reversed the Ramsey County district court decision which had voided this modified rate schedule. The action of the Minnesota Supreme Court is highly important for future telephone regulatory procedure because it supported unequivocally the right of a regulatory commission to determine rates through negotiations with the telephone company in arriving at a schedule of charges for the public made in good faith on the basis of current conditions and for the best interests of the telephone service.

The decision of the Minnesota Supreme Court is expected to end the controversy which has been in progress over the rate reduction order of the Minnesota Commission handed down March 31, 1936. As a result of the May 2, 1939, modified rate reduction order of the Minnesota Commission, the Tri-State Telephone & Telegraph Co., agreed not to appeal the 1936 rate order to the U. S. Supreme Court. It is not believed that the two St. Paul subscribers who attacked the May, 1939, compromise order as void on the grounds that it was not preceded by rate hearings and secured the support of the City of St. Paul and Ramsey County will be taken to the nation's highest tribunal.

The Minnesota highest tribunal held that, while a proceeding was pending in court to determine the reasonableness of rates, the commission and the telephone company in negotiations in which the Attorney General participated could reach an agreement to end the litigation by prescribing a new rate of schedules for the future without hearings or taking of testimony.

"Where the utility proposes a new schedule of rates as contrasted with the case where a change in rates is over the objection of the utility," the Minnesota court held, "the commission need not necessarily have a valuation of the company and a tedious and expensive litigation."

Patrons Have No Vested Rights To Any Fixed Rates

THE state supreme court cited that under the Minnesota statute (Mason Act) the state commission may sanction such proposed rates without notice and hearings where it is of the opinion that the rates are just and reasonable and in sanctioning such proposed changes of rate schedules the commission performs the legislative function delegated to it.

"In doing so it represents the public —the patrons of the public utility," the Minnesota Supreme Court opinion stated. "The patrons or users of the company's services have no vested rights to any fixed rates." The supreme court held that the public and the City

"It seems we're not the only ones annoyed by Jones' loud talking on the phone."

of St. Paul were represented in the proceeding regarding the determination of the May, 1939, compromise rate order as their interests were represented by the commission and Attorney General.

The Minnesota Supreme Court described the 1939 modified rate order as "a consent order." It cited that the 1927 Minnesota (Mason) statute Section 5291 "impliedly authorizes the commission to sanction new rates proposed by a telephone company without formal notice of hearings and taking of testimony, if satisfied that the rates are just and reasonable and, as to users of services, the (commission) order of May 2, 1939, appears to contain adequate findings." The court cited that the company's views of that statute is that it has the right at any time to propose a new schedule of rates in place of the one in operation provided it is approved or sanctioned by the commission. The court added, however, that where the telephone company presents a rate proposal and consents to the revision "it cannot thereafter raise any claim that the rate is confiscatory."

Court Cited Facts on Which 1939 Modified Reductions Based Not Under Attack

CITING that the commission in determining whether the proposed new schedule of rates is just and reasonable need not engage in a valuation or lengthy litigation, the supreme court noted that the commission may already have knowledge of the situation and no statute "is pointed to which prescribes that there must be notice given of hearings and testimony given if the commission has all the necessary information for determining whether the rates proposed to supersede those in force are just and reasonable." The court then noted that the facts which resulted in the 1939 modified order had been admitted and were not vulnerable to attack by the users as it was of common knowledge labor and materials had greatly increased, together with taxes, since the original 1936 rate reduction.

The compromise rate order was valid for a further reason, the state supreme court held, because the rate schedule fixed in the 1936 order was based on lengthy hearings which started in 1929 and "parties to litigation have the right to compose and agree to settle a dispute at any stage of the proceedings and that was what was done here" the court added that there was not the slightest hint in the record or in the argument of counsel that the agreement to end the litigation "was not made in the utmost good faith" and cited that the expenses of litigation had been enormous with more in sight, together with uncertainty and delay, if the company carried the case to the U. S. Supreme Court. The Minnesota statute, Section 5298 of the code, which requires the commission to give all interested parties a chance to furnish evidence and be heard applies when the commission deems it necessary to have a valuation of the property of a utility. Associate Justice Andrew Holt handed down the opinion of the Minnesota Supreme Court. Associate Justice Royal Stone and Harry H. Peterson did not participate in the findings.

Convention Dates

Telegraph and Telephone Section, Association of American Railroads, Chateau Laurier, Ottawa, Ont., Can., September 10, 11 and 12.

Telephone Association of Maine, New Hampshire Telephone Association and Vermont Telephone Association, joint meeting at Poland Spring House, Poland Spring, Me., September 12 and 13.

South Dakota Telephone Association, Sioux Falls, October 3 and 4.

United States Independent Telephone Association, Hotel Stevens, Chicago, October 15, 16, 17 and 18.

Independent Pioneer Telephone Association, Hotel Stevens, Chicago, October 17.

Tennessee Independent Telephone Association, Hermitage Hotel, Nashville, October 28 and 29.

Alabama Independent Telephone Association, Montgomery, October 31 and November 1.

Florida Telephone Association, November 5 and 6.

South Carolina Independent Telephone Association, November 11 and 12.

North Carolina Independent Telephone Association, Sedgefield Inn, between High Point and Greensboro, November 14 and 15.

Virginia Independent Telephone Association, Roanoke Hotel, Roanoke, November 18 and 19.

Missouri Telephone Association, Muehlebach Hotel, Kansas City, November 18 and 19.

Kentucky Independent Telephone Association, December 3 and 4.

The Washington State Decision

IN its denial of the proposed $1,500,000 increase in rates of the Pacific Telephone and Telegraph Co., in the State of Washington, including the absorption by subscribers of $275,000 occupational taxes in six cities and the installation of metered service in Seattle, the 45-page opinion and findings of the Washington State Department of Public Service, which has just been received, was one of the most sweeping attacks on Bell System policies. It particularly assailed the license contract costs and pension expense. The decision followed closely the views and reasoning brought out in the FCC Telephone Investigation.

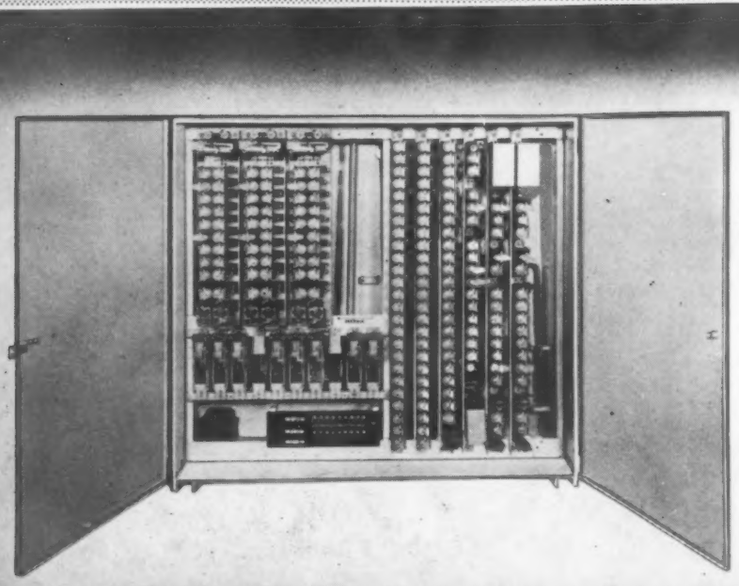
The decision is now being studied by the attorneys for the Pacific Telephone and Telegraph Co.—Arthur T. George, Winlock Miller, Jr., A. G. Paine and Otto B. Rupp—undoubtedly with consideration of instituting a court test. The Washington State Department in its findings ruled upon the projected rate increases totaling approximately $1,500,000 per year but held in abeyance the decision on its own general rate investigation. The ruling on the rate investigation, was reported from Washington state as likely to come out in 30 to 90 days, although some sources felt it might take many months for issuance.

It will be recalled that the application for the rate increases and the department's rate investigation were consolidated in the proceeding which was an "unusually complete" rate hearing with a transcript of more than 2,800,000 words, testimony from 140 witnesses with 85 days of hearings over 10 months and 462 exhibits.

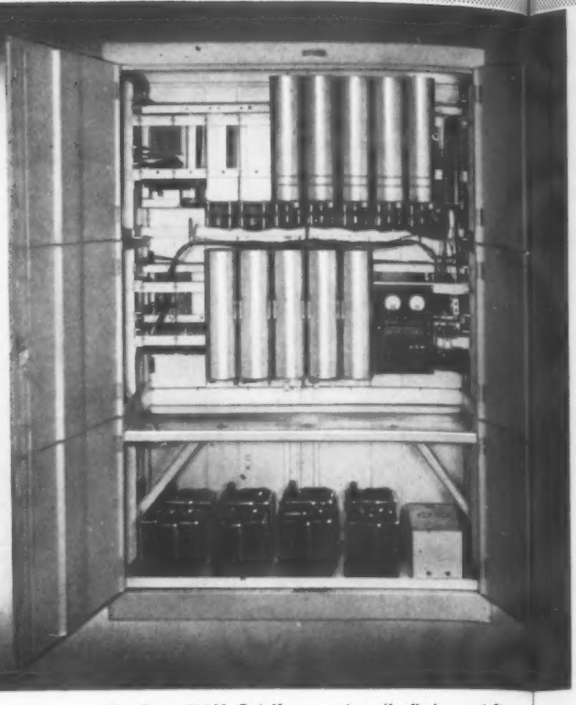
The Washington Department's decision seemed rather vulnerable to an attack in court as it was fashioned together in a loose and sketchy manner with practically no correlation between the various phases of Bell System practices which were assailed in the rate ruling. For example, the Washington Department did not correlate the disallowance of the license contract costs with the rate of return and disallowed the license contract payments on the grounds of a Washington state law which appeared to be rather predicated on an unconstitutional interpretation of its scope. In fixing the rate of return

(Please turn to page 26)

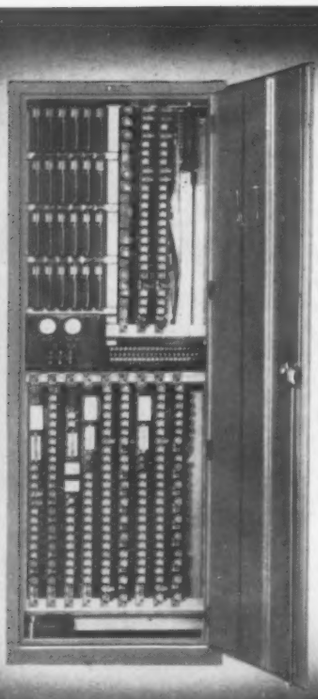
SAVE MORE - EARN



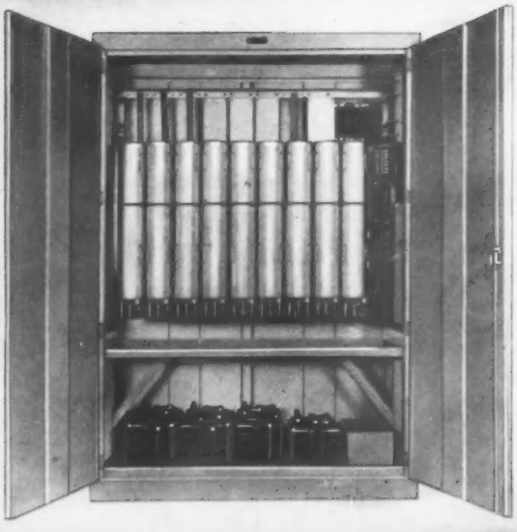
The Type 36A1 C-A-X- has a capacity of 19 lines, 4 links and 3 trunks. It uses rotary linefinders and rotary connectors.



The Type 32A32 C-A-X uses rotary linefinders and Strowger connectors, and serves central battery telephones. Capacity 50 lines (first unit) or 90 lines (with second unit added).



The Rotor Relay C-A-X uses the Automatic Rotor Relay and standard Automatic Electric "horizontal" relays. The capacity of the switchboard shown here is 30 lines, 4 links and 5 trunks.



The Type 32A44 C-A-X serves either central battery or magneto telephones, and either metallic or grounded lines. It uses rotary linefinders and Strowger connectors, and with one unit has a capacity of 50 lines; with two units, 90 lines.

The Type 35E97 C-A-X ranges in capacity from 10[illegible] circuits. It employs Strowger linefinders, selectors nectors.

ORE - SERVE BETTER

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Automatic Electric switchboards

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Highly important, too, is the fact that Automatic Electric engineering recommendations are backed by the most extensive experience in small exchange design and manufacture in the Independent field—fifty years of designing and building small automatic boards for every conceivable condition of traffic and service.

When you consult with Automatic Electric engineers as to what type of equipment is best suited to your situation, you get the benefit of both the engineering and the commercial viewpoints. You are assured of an installation with adequate amounts of equipment, of a type suitable for your traffic conditions, and one that will mean modern service and definitely profitable operation from the very day of the cutover.

Isn't such an outlook worth a letter to us, describing your own exchange situation? We'll answer promptly, with full information as to what savings you can expect Automatic Electric equipment to make as compared with your present method of operation. Write to us—today!

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at 5.28 per cent on the present rate base, the department made no foundation for its findings on the cost of money and no justification of whether its own assumed rate base represented fair value. It based its determination on assumed savings in operating expenses from the dial conversion program. Likewise, the Department in its determination of depreciation expense did not advance any proof of its reason for reducing the company's accural rates.

Cites Dial Conversions Would Have Reduced Operating Costs

A HINT that the Department will probably institute a rate reduction was given in its discussion of the dial conversion program of the Pacific Telephone and Telegraph Co. in the State of Washington, the opinion citing that large and substantial savings in operating expenses totaling about $700,000 annually in three exchanges of Seattle, Tacoma and Spokane, would result from the automatic installations. "It is the duty of this Department to make rates at this time that will be fair and reasonable for some time in the future," the Department's opinion stated. "We therefore believe that it is not only necessary but that it is our duty to give full consideration to the savings that can and will accrue during the next few years by converting the present manually-operated central offices to dial operation." The Department, which criticized severely the telephone company for its failure to carry out an orderly program of converting the central offices in those cities and in smaller manual exchanges to dial operation stated that, if this program had been accomplished, rate reductions, instead of applications for rate increases, "might well have eventuated." The Department, however, did admit that the telephone company had planned its dial installations so as not to disrupt employment and to aid the Western Electric in smoothing out their curve of installation and manufacture.

All rate increases proposed by the Pacific Telephone and Telegraph Co. in the state, were denied by the Department. These included the passing on to subscribers of the occupational taxes, amounting to $275,000 annually in Seattle, Spokane, Bellingham, Olympia and Shelton; a $165,000 increase in intrastate toll rates for calls on distances greater than 56 miles; a $550,000 increase in the Seattle exchange rates which would have permitted the installation of metered service and elimination of the four-party lines and most of the suburban 10-party lines; and a $500,000 general increase in exchange rates in other sections of the state exclusive of Seattle and in Clarkston, Idaho. The Department's decision was unanimous, being handed down by John G. Abel, director, A. M. Garrison, supervisor of public utilities, and Ralph J. Benjamin supervisor of transportation.

Regulatory Body Feels Local Management Should Have Greater Power

IN general, the main attack of the state regulatory body was against the accounting expenses and policies which have been standardized for the Bell System and the relationships between the American Telephone and Telegraph Co., Western Electric and the Pacific Telephone and Telegraph Co. This viewpoint was epitomized in the Department's conclusions with this brief summation: "That the local management of this company should be given greater freedom of action in handling matters in this area. If such authority were granted, we believe that many of the problems discussed herein could have been solved without this time-consuming and costly investigation. The fine spirit of cooperation and fairness shown by Mr. Dix (I. F. Dix, Vice President and General Manager of the Pacific Telephone & Telegraph Co. Washington-Idaho area) throughout these proceedings were of great assistance to the Department. We feel that he is a man of high ability and integrity."

The Department in its finding established a rate base of $39,550,000. It allowed plant in service at $60,600,000 as contrasted to the company's claim of $70,000,000 book cost for plant and the company's claimed reproduction cost of plant of $69,700,000. A depreciation reserve of $22,300,000 was fixed by the Department with allowance of working capital of $1,300,000. The Department stressed that it founded its assumed rate base solely on intrastate telephone operations and had reduced by a little over $3,100,000 the depreciation reserve of the company on that basis. In regard to working capital, it stated that it allowed one-twelfth of the annual operating expenses which it felt resulted in a liberal allowance.

The Department's decision was featured by the slicing of $555,988 from the company's operating expenses for 1940. Of this the largest item was the reduction in the annual depreciation expense which amounted to $253,600 with the statement that the company's estimate of service lives and salvage for large and important classes of property are too low and annual depreciation accrual calculations are too high, so the company depreciation figures are "unreliable or subject to serious question." The Department added that no more than 3.77% on depreciable property or 3.425% on total plant in service should be allowed as maximum annual depreciation accrual rates in the state

I WONDER WHY SOMEONE DOESN'T INVENT

by Quizzicus

An adjustable periscope arrangement to mount in the top of a trouble car so that a lineman may watch a line for trouble and drive at the same time without danger of breaking his neck.

A cable ring covered with a heavy coating of lead which may be used to support aerial cable and avoid ring cuts.

A sectional type duct rod made of aluminum to provide strength, without the excessive weight now so common in rods of this variety.

An inexpensive keeper to protect the teeth of a hand saw when placed in a construction truck or a tool box.

A small metal wall shelf bracket to support a desk type telephone when the use of a floor stand is not conenient.

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and added "we are giving serious consideration to additional adjustments which would result in still further reductions" in depreciation expense.

Would Have FCC Undertake Study of License Contract Costs

THE next largest operating expense slash was $205,000 in license contract expense and the Washington State Department followed almost the same language as the FCC Investigation Report in disallowing all license contract expense on the basis that these services should be primarily charged against the stockholders of the American Telephone and Telegraph Co. because the services protected the "integrity of their investment." The Department cited that the Washington state laws placed the burden on the utility of proving payments to an affiliate reasonable and the telephone company had failed to give satisfactory proof with cost records.

The FCC should undertake a solution of the license contract problem, the Washington State Department proposed. "Essentially, this license contract problem is one which cannot finally or satisfactorily be solved by the individual states," the Department's opinion asserted. "Since it involves relationships and expenses applicable throughout the entire Bell System, it seems to be a problem for the Federal regulatory body, which alone possesses jurisdiction over both the fee-paying and fee-receiving parties to the contract."

The pension expense of the Pacific Telephone and Telegraph Co. in view of the Social Security Act was "seriously questioned" as to its propriety of being included in operating expenses by the Department which slashed $114,527 pension accrual operating expenses from the rate base for 1940. The Department said that the A. T. & T's pension plan had never been properly explored by any regulatory agency although the FCC now has the matter under consideration and "there are many questionable features in connection with the plan which require further scrutiny."

Would Limit Pensions to $250 a Month

IN a concurring opinion, A. M. Garrison, Supervisor of Public Utilities, stated that the Department's order questions the propriety of charging to operating expenses accruals for pensions to retired high salaried executives and proposed that the telephone company should have a limitation placed upon it not to pay pensions in excess of $250 a month. Any employee with a salary to provide a pension in excess of that amount "has been at all times in a position to provide for his own future security." In placing this limitation, Mr. Garrison declared that he recognized the "great majority of subscribers" contributing to the pension fund in the payment of rates "actually earn considerably less than $250 a month." This limitation will affect only a small number of telephone employees, he added.

The Department's opinion regarding pension expenses opposed any increase in the pension accrual rates as not necessary because of the stability of the telephone business so there would be no danger of a complete disbursement of the pension fund.

Increased Rates Would Produce Return of 8.6 Per Cent

IN discussing the rate of return, the Department claimed that the company's proposed increased rates in 1940 would produce a return of 8.6%, but under the adjusted rate base, fixed by the Department, with the present rates in effect a rate of return of 5.28% would be achieved in 1940. The Department estimated that it was "obvious" the company's net earnings will approximate $2,000,000 this year which would yield a return of more than 5% under the adjusted rate base. The Department then noted that in determining this 5.28% return no consideration has been given to the savings in operating expenses of approximately $700,000 a year from dial conversions scheduled during the next three years. It added that there is substantial evidence in the record to indicate the annual depreciation expense is in excess of requirements.

The Department then declared that after taking into consideration the reductions in operating expenses to be realized in the next few years, it had found the telephone company had failed to sustain the burden of showing why the Department should approve its proposed increased rates or why the present over-all intrastate earnings will not produce a reasonable return.

The Department rejected the telephone company's claim of fair value for its plant in Washington amounting to $68,000,000 and delved at some length into the company's position on reproduction cost. Citing that the equipment in the plant was furnished to a large extent by Western Electric, the Department contended that since Western Electric is a wholly owned subsidiary of the A. T. & T. it is essential to determine whether its prices are reasonable. The Department also assailed by inference the Western Electric overhead costs and said the testimony by

(Please turn to page 33)

"Reliable" One-Piece No. 955 STATION PROTECTOR

• This one-piece Station Protector materially simplifies mounting and eliminates all need for asbestos mats. Connections are conveniently executed on heavy binding posts with studs treated to withstand corrosion. Equipped with *"Reliable"* self-cleaning sawtooth discharge blocks and *"Reliable"* No. 55 or No. 77 fuses as specified.

Samples on request.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

LINE and DESK

RAY BLAIN, Editor

ADDRESS YOUR QUESTIONS TO LINE AND DESK EDITOR. NO CHARGE.

Q. We plan to parallel two sets of equal sized storage batteries for use on a telephone exchange and would be pleased to receive some information as to whether this may be accomplished satisfactorily?

A. This arrangement is a common practice these days and proves entirely satisfactory. Some such installations are merely connected in parallel at the ends of the complete batteries while others connect each individual cell in parallel.

Q. What means would you suggest for accurately pulling messenger and line wire to the proper tension so that it may give maximum life and trouble free service?

A. We would recommend the use of the new low priced dynamometers which weigh only 9½ pounds. With the aid of this instrument any ordinary workman, without engineering knowledge may quickly and accurately pull messenger strand or line wire to the proper tension. The smaller size dynamometer is calibrated in 50-pound divisions and the larger sizes in 100 and 125-pound divisions. One or more of these instruments will prove a good investment in any exchange.

Q. We have experienced considerable trouble with our large line construction truck in traffic as the signals of the driver cannot be plainly seen when making a turn. Will you advise how this difficulty may be overcome?

A. We would suggest the use of direction signals which have an illuminated arrow to indicate the direction the truck will turn. Switches equipped with tell-tale lights which illuminate indicating direction is arranged for convenient mounting on the steering column. This installation will not cost much and will prove an important factor in the operation of any line truck.

Q. We are experiencing considerable difficulty with the operation of our gasoline operated blow torches and cable splicers furnaces due to the difficulty of obtaining untreated gasoline. Leaded gasoline soon causes these tools to become inoperative and we would be pleased to know whether torches and furnaces may be successfully operated on kerosene?

A. Kerosene may be used with complete success in properly designed torches and furnaces. However, not all gasolines sold today contain lead or other chemicals detrimental to the operation of gasoline pressure appliances. Usually the cheapest, low priced gasolines do not contain Tetra-Ethyl though some of these gasolines are colored for identification purposes. The United Laboratories, 240 N. St. Francis Street, Wichita, Kans. periodically issues bulletins listing gasolines sold in the various states which are satisfactory for use in any pressure gasoline burning appliance.

One type of kerosene burning furnace attributes its success to the fact that ample generating space is provided by the use of a figure"8" shaped coil, properly placed. The fuel is taken into the lower "colder" part of the coil, gradually warmed and gassified as it climbs. After passing through the first two loops of the coil, the fuel is about as hot as it ever becomes in the ordinary generator. Due to the "8" shaped generating coil the hot gas is passed through the heart of the flame twice. The dry gas, properly mixed with air, burns with a clean blue-yellow flame, which it is claimed is as hot and in every way as satisfactory as a gasoline flame.

For those who desire to make use of kerosene in their blow torches and furnaces we would suggest that they buy equipment designed to burn kerosene, be content to wait a little longer to generate and contend with a bit more smoke in starting and results otherwise will be entirely satisfactory.

Q. Will you advise whether it is possible to obtain a small pocket phone which may be conveniently carried in an ordinary coat pocket?

A. There is such an instrument available which consists of a combination transmitter and receiver mounted in a single case and which may be used as a common battery test set. This complete unit weighs only 4 oz. and is equipped with cords and test clips. The unit talks up well as a transmitter and also functions well as a receiver. This set may be purchased from almost all telephone supply houses.

Q. We understand that a new method of cutting gains in poles is now being used. If this is true will you please explain the approved method and what benefits may be obtained from its use?

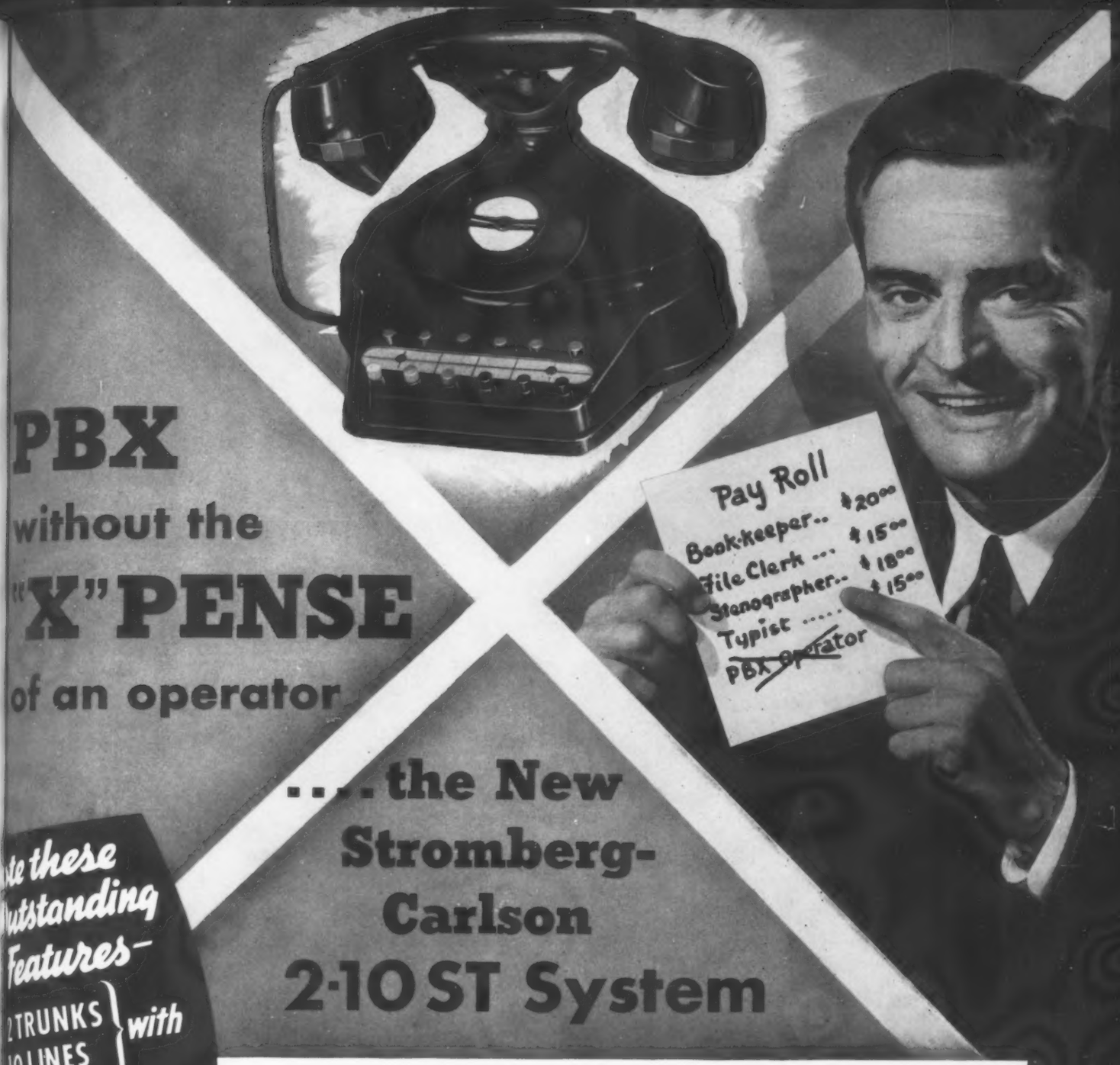
A. A new method of pole gaining is now being used by some of the larger companies which instead of cutting individual gains for each crossarm a single slab gain is made for the entire number of crossarms to be mounted on a pole. As an example of this if four gains placed on 24-inch centers, the top 8" below the roof, are required, a slab is shaved from the pole for a distance of about 90" which permits the mounting of all crossarms. This slab gain is claimed to have an advantage in that it eliminates to a great extent the collection of moisture between the pole and crossarm. The larger companies now using this method are requiring that the slab gain be machine planed prior to treating the pole with preservative. The one cut, or sloping roof is now commonly used in lieu of the pointed roof as it provides better drainage and reduced breakage in shipment. A one way roof should be cut on an angle of 15 degrees.

Q. We want to seal the rear panels of our switchboard against the entrance of dust and would appreciate your opinion as to how this may be best accomplished?

A. Felt strip may be used by gluing it around the edges of the grooves into which the rear panels mount. Another system which provides a very good dust stop and is perhaps more lasting is to cut a groove in the panels and glue a small rubber hose into it. This hose should be embedded about half its thickness into the groove and the part which extends above the surface of the panel is compressed slightly to close the opening against the entrance of dust.

Q. What type of hammer is considered satisfactory for a lineman to carry in lieu of a broad hatchet?

A. When for any reason the ordinary hatchet is not to be carried by linemen we prefer a special linemans, double face hammer. The blade of a broad hatchet is seldom needed by a lineman and they are frequently the cause of serious accidents.



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Note these Outstanding Features—

2 TRUNKS } with
10 LINES }

- Selective Ringing
- Selective Talking
- Secret Service
- 100% Talking Facilities

In the new No. 2-10 ST System, Stromberg-Carlson offers a system that provides both intercommunicating and central office service without the expense of an attending operator.

It has 2 central office trunks and 10 stations.

Of instant appeal to prospects is the fact that ***all 10 of these stations*** have selective ringing, selective talking and secret service ***on both central office calls*** and ***local.***

Similar in design is the Stromberg-Carlson No. 3-9 ST System which provides 3 central office trunks and 9 stations.

These two systems enable you to find many prospects among smaller businesses who do not care to go to the expense of a PBX operator. If you have some specific installation in mind, let us send you a proposal for it and you will see just how salable these systems are. Merely use the coupon.

SPECIAL NOTICE: The new selective talking feature can be applied to the Stromberg-Carlson 2-10 System already in use by merely changing the relay cabinet.

STROMBERG-CARLSON TELEPHONE MANUFACTURING CO.
Factory and General Offices: 100 Carlson Rd., Rochester, N. Y., U. S. A.
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Gentlemen;
Please send me proposal on a Stromberg-Carlson ST System for the following requirements:

No. of stations:_____ No. of trunks:_____
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Company _____

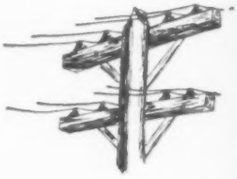
City _____ State_____

By _____

Stromberg-Carlson

MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR FORTY-FIVE YEARS

LONG LINES



R. A. Clark, Jr.

The Operation of a Transmission Set as a Balance Indicator for Duplex Telegraph Circuits

THIS article describes the operation of a transmission set for a balance indicator used in obtaining static balances on duplex telegraph circuits.

The object of a duplex balance is to secure a perfect equality between the transmitted currents entering the real and artificial lines. To obtain this equality requires that the artificial line be an exact duplicate of the real line in all its electrical constants. In practice it has been found that a working balance can be obtained with a comparatively simple artificial line consisting of resistance, capacity and sometimes inductance which can be varied to give a fairly close approximation of the constants of the real line.

With such an arrangement it has been a simple matter to obtain good resistance balances because meters are provided which clearly indicate any ohmic unbalance and show unmistakably when the best resistance adjustment is obtained. The adjustment of the static balance has, however, offered a more complicated problem. While a static unbalance is evidenced on the usual line meter, the effects are transient and appear as brief "kicks" which are difficult to distinguish, particularly with other disturbances present on the line.

The balance indicator will give a relative measure of the amount of static unbalance and shows when the best balance is obtained. It will also distinguish between disturbances caused by unbalance and those from other sources.

The connection of a balance indicator to a duplex set is shown in Fig. 1. The procedure for making a balance test is as follows: First, the distant station is switched to a balancing ground and the home station makes an ohmic balance. The balance indicator is then connected to the duplex set as shown in Fig. 1. If, under these conditions, the home station is sending steady battery or is on balancing ground, the meter can be deflected only by the interference currents present on the line. This reading, commonly called the "induction reading", indicates the condition of the wire. It should be noted that an excessive induction reading indicates certain types of abnormal circuit conditions such as earth currents, heavy induction, crosses, etc. A record of normal induction recorded in db should be kept for each telegraph line.

If A-C is transmitted from the home station, the meter will read the combined effect of the interference currents and those due to static unbalance. This reading will equal the induction reading only when a perfect static balance has been obtained. In balancing, the staic elements of the artificial line are manipulated to bring these two readings as near alike as possible. Any change in the proper direction will result in a corresponding reduction in meter reading, thus the instrument indicates the direction in which changes should be made and shows when a balance has been obtained.

Since the induction level on a line is not usually constant, the two readings should be compared from time to time during the balancing operations and as the balance is refined the sensitivity of the instrument should be increased to obtain as close a balance as possible. When line resistance boxes are used, to reduce the line current or for other reasons, balancing operations should not be started until the line resistance boxes are adjusted to the desired values at both stations. The function of the duplex balance at repeater points is the same as at terminals and is obtained in the same general manner at both types of stations. The apparatus associated with balancing is practically identical at both types of stations and is manipulated in a similar manner.

The balance and induction reading on various circuits may be compared. Such comparisons should be made with the indicator at full sensitivity, if possible. In some instances it may be impossible to use full sensitivity and in such cases, the sensitivity as well

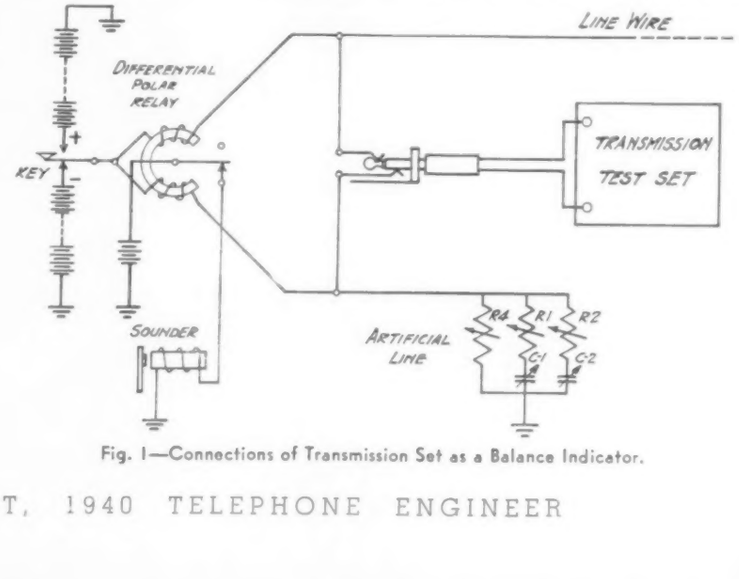
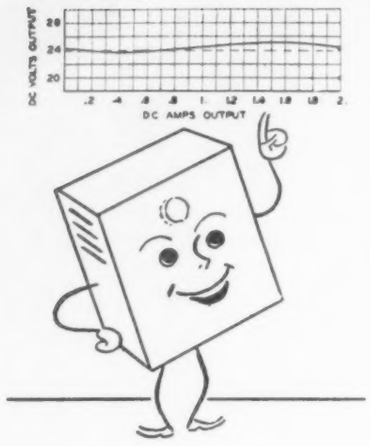


Fig. 1—Connections of Transmission Set as a Balance Indicator.

Say, listen! Did you paddle me out here just to rave about *Western Electric* LEAD COVERED CABLE?

Distributed by Graybar

For details on Western Electric cable to meet every telephone need, write to Graybar Electric Co., Graybar Building, New York. In Canada: Northern Electric Co., Ltd. In other countries: International Standard Electric Corp.



Stabilized voltage from no load to full load for proper PAX and PBX operation is provided by Raytheon RectiFilteRs. These units are efficient, compact, require no maintenance, quickly pay for themselves. Plug in a RectiFilteR and forget it.

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RectiFilteRs are the modern, economical way of obtaining DC telephone power direct from an AC source. Full range of sizes. Supplied when necessary to furnish DC power during AC interruption. Write for bulletin DL-48-156F

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as the deflection should be noted.

When taking a balance, best results are obtained in a minimum of time if the following procedure is followed:

(a) With the distant station on balancing ground, take an ohmic balance in the usual manner. Do not disturb the line resistance box during the following operations.

(b) Put the decibel knob of the transmission set in the +20 position and the test switch on REC. Patch from the SR jack on the transmission set to the BAL jack.

(c) Compare the induction reading, obtained when the home set is on steady battery or on balancing ground, with the reading of the indicator when A-C is transmitted from the home station.

(d) Adjust the artificial line capacity C1 and C2 and resistors R1 and R2 to decrease the reading when A-C is transmitted. Make a final check by adjusting R4 slightly, not over a few ohms.

(e) As the balance is refined, increase the sensitivity of the meter and continue the comparisons until the A-C reading has been made as nearly equal to the "induction reading" as possible. The final adjustments should be made with the meter at full sensitivity, (on the —10 scale) In general a good balance has been secured if the indicator reading does not increase more than ½ db when A-C is transmitted.

(f) Remove the balance indicator from the jack, and "O.K" the next repeater or terminal. **CAUTION:** To prevent possible injury from excessive current, care should be taken to see that the balance indicator is not plugged in except while the distant end is grounded and when actually taking the static balance.

After a little experience in the use of the balance indicator, the above routine may be carried out very quickly.

Will Picnic this Month

On August 29 telephone people from all of Northern Indiana will assemble at Roth Park on Lake Freeman for one of those good old fashioned Benton Picnics. It has been quite a few years since a picnic has been held in the Benton District and the revival of this old and popular custom is sure to bring out a large crowd. Arrangements are being made for the serving of the noon meal by the Roth Park Hotel and plenty of amusements including bathing, boating and fishing will be available. Telephone company employees from all of Indiana and manufacturer's representatives will be welcome.

Named Assistant on Defense Advisory Board

THE National Defense Advisory Commission has appointed another telephone engineering expert to the staff of William S. Knudsen in charge of the defense production activities. The new selection was W. V. Kahler, Chief Engineer of the Illinois Bell Telephone Co. in the Chicago area who was designated as a consulant to W. H. Harrison, Vice-President and Chief Engineer of the American Telephone & Telegraph Co., who is in charge of all construction activities in the production branch of the Defense Commission.

W. V. Kahler

Mr. Harrison requested the services of the Illinois Bell Chief Engineer last month and it is anticipated that Mr. Kahler will remain in Washington for about three or four months on his defense post.

Mr. Kahler, who is 41 years old, and was born in Mendon, Mo., has spent his entire business career in the telephone industry. After graduating from the University of Missouri, he went to the Bell Laboratories and following 2½ years in laboratory testing and circuit designing entered the service of the Illinois Bell engineering department in 1924. Three years later he was transferred to the Chicago plant department and was appointed in 1930 its division plant supervisor. During that same year he was transferred to the A.T.&T. in New York, being assigned to central office equipment maintenance problems. In 1937 he became maintenance engineer of the Illinois Bell and the following year was made chief engineer for the Chicago area.

The Washington State Decision

(Continued from page 27)

company representatives on Western Electric costs and prices lacked "probative value" for determining reproduction cost.

The Washington state regulatory body adopted the station-to-station basis of rate making and stated that it was imperative for the company to proceed at once to furnish separation data as a current operating routine. The company was asked to construct its tariffs on a station-to-station basis.

While it did recognize the license contract arrangement as a "mechanism of importance and frequently of much value to the Bell subsidiaries," the Department was highly critical of the alleged lack of proper accounting to the State of Washington by the A. T. & T. on the services rendered under the license contract. "We do not question the propriety of allocating the cost of certain licensee services of a general nature, definitely not of a holding company character where value of service is not in question and where direct assignment to companies or states cannot be accomplished," the Washington Department opinion read. "However, it is our view that costs directly incurred for specific companies and states should be kept by those subdivisions, and charged to them alone. Thus we feel that American Company expense in connection with a rate proceeding in Oklahoma (for example) should be charged to Oklahoma, and no portion should be allocated to other states as is now the practice of the Company. Certainly, no portion of any such cost should be allocated to the State of Washington. Primarily such expenses are incurred by the holding company to protect the integrity of its investment and should appropriately be absorbed by the stockholders rather than by subscribers in territory far removed from the state in which the controversy arises."

Although it was brought out in 1938 the A. T. & T. had rendered services costing $317,457, and had received $206,493 in payment, the Department opinion declared "this allocation of alleged 'costs' was based on certain purely judgment factors, depending on the nature of the services involved, whether engineering, legal, personnel, and the like, or in relation to some other department of the American Company.*** Nothing appears in the exhibit or in the record, showing specifically the amount of such direct costs, or convincingly justifying the ascription to the Washington operations of The Pacific Company of an amount computed according to the exhibit, or of any other defined amount. A large portion of these expenses are primarily for the benefit of the holding company's investors rather than the rate payers."

In advancing the idea that the FCC should undertake an inquiry into the license contract problem, the Washington Department stated that "when it is finally determined what portion of the costs of performing the services under the License Contract is properly chargeable to the subscribers rather than to the American Company stockholders, it would immediately be necessary for the American Company to maintain records adequate to enable every state of the Union to secure the necessary data for their own determinations in individual cases. Under such circumstances all actual and direct costs attributable to services to individual companies and states should be segregated on the American Company's books. Reasonable allocation should then be possible in respect to non-segregable costs of services which are unquestionably of a License Contract character, and all other costs may then be attributed, as they should be, to the cost to the American Company of holding the securities of its subsidiaries and of protecting the large investment interest of its own stockholders."

Much of the Department's discussion of the pension plan dealt with the method of accrual and discussed the so-called unfunded actuarial reserve requirements. The Department said that if there does exist an unfunded pension liability the halting of its growth does not eliminate its presence and it must be recognized that complete amortization of the pension plan would

ARGYLE TELEPHONE COMPANY
H. J. Jones, Owner
Argyle, Texas
August 2, 1940

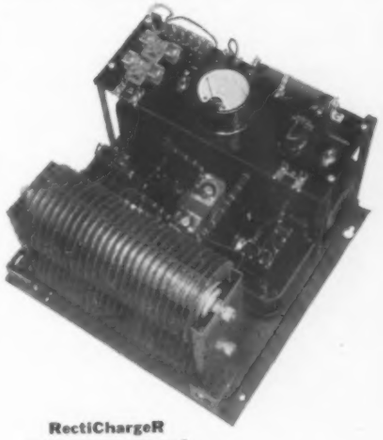
Telephone Engineer;
7720 Sheridan Road.
Chicago, Ill.
Dear Sirs:

Enclosed is check for one Dollar to cover our subscription to the Telephone Engineer, and the Fortnightly Telephone Engineer.

We cannot express too highly the usefulness of this magazine in our business, and hope that we may continue to enjoy the educational articles that have heretofore been published.

Very truly yours,
(Signed) H. J. Jones.

Noise, frying transmitters, short battery life, incorrect ringing, and many other operating troubles are often caused by overvoltage resulting from overcharging. Raytheon RectiChargerRs maintain constant output voltages, and help to correct these conditions.



RectiChargeR with cover removed

A RectiChargeR with a small storage battery floating across its terminals makes a complete, automatic, AC-DC, constant-voltage telephone power unit. Components are long-lived, maintenance-free. Consult your usual source of telephone supplies for the correct RectiChargeR for your needs. Write for bulletin DL-48-263ATE.

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Build Goodwill and Revenue

WITH THIS SMALL

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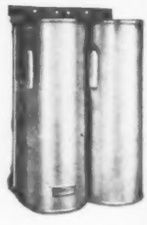

Key type telephones, such as the one shown above, plus this compact switching unit, provide automatic intercommunication combined with direct trunk service at low cost.

This system—the Type 32-A—is just the thing for residences and small businesses where an attended system is impractical. Your subscribers will be delighted with the service it gives—**and you'll like the extra revenue it commands.**

The 32-A is adaptable to automatic or manual central offices, and will serve up to six key-type telephones. Let us tell you more about it.

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not be expected to occur with respect to the telephone companies. Since it is anticipated that the telephone business will not terminate at any foreseeable future date but instead, will continue to grow and expand, the Department opinion said, "it appears that there will never be any demand for the complete disbursement of the pension," and under these circumstances the normal accrual rate of 2.39% will be sufficient to maintain the fund at a level necessary to supply the needs for the orderly retirement of superannuated employees." The Department added that "the propriety of any charges whatsoever to the present subscribers resulting from the so-called unfunded actuarial reserve requirement is seriously questioned."

The Department also raised the question as to the propriety of the normal accrual rates and said there was no proof in the record that the A. T. & T.'s rate may be properly applied to determine the actual costs for the State of Washington. "Indeed the Pacific Company itself has never verified the reasonableness of the charges but has merely accepted the recommendations of the American company, indicating that the matter is not an arms length transaction," the Department opinion stressed.

The Washington State regulatory body declared that it was its considered view, pending further examination of the entire pension problem of the telephone company as it affects the State of Washington and pending action from the accounting viewpoint by the FCC (though such accounting ruling would obviously not be binding upon the Department in operating expense allowance in a rate proceeding), the Pacific Telephone and Telegraph Co. shold not be authorized at this time to charge to current operating expenses any sums other than those which may be obtained by the application of the normal accrual rate of 2.39%."

Who Owns What? Puzzles Nebraskans

If anybody knows who owns the telephone exchange properties at Hayes Center, Nebr., county seat of Hayes county, maybe the general manager of the Central Nebraska Telephone company would be glad to be informed. This company has headquarters at Denver, but operates a number of small town exchanges in counties adjacent to Hayes.

The company applied to the railway commission some months ago for authority to purchase the Hayes Center exchange, conditioned upon being allowed to charge tolls on the line connecting it with the company's exchange at Palisade. Local subscribers objected, and the commission turned down the toll charge.

John H. Schnell, commission chief accountant, was present at the hearing at Hayes Center, and says further negotiations broke down when it was ascertained that the elderly widow who operates the exchange, a Mrs. Hillman, could not show title. Started originally as a mutual company, farmers contributing to the cost of the property and getting service at cost, when the property wore out to the point where service was bad, donations were made for rebuilding, and the exchange turned over to Mrs. Hillman to operate. She does so and takes her pay out of the sums she collects. As Mr. Schnell recalls it, no one was able to show or knew who the real owners are, since it being a mutual company, nothing appears of record.

Secy. Truman of the commission says the situation was almost duplicated at Brewster, county seat of Wheeler county. The owner, named Erickson, operated it until his death, and when his widow moved to California, she turned it over to the person in charge of service. Later the Millburn-Anselmo company built into Brewster.

Several companies, particularly those operating at Inavale and Roseland, have titles to their properties so intermingled that Mr. Schnell has never been able to untangle the situation. Five companies with lines running into Inavale own the switchboard, and a similar situation exists at Roseland, where a number of companies service a considerable territory.

A number of mutual companies are in somewhat the same fix. Their lines were built by the farmers in the area covered, each contributing money and labor. Later these original owners died or moved away, and as there was no title to transfer, the next comer on the vacated farm assumed the cost of maintaining the lines and paying for being switched at nearby town exchanges.

Gorman Telephone Company Comes into Being

Word from E. A. Speck, formerly in charge of the River Road Telephone Lines, Amarillo, Texas, notifies us that effective August 1, their properties passed into the hands of the Southwestern Bell Telephone Co. and that his company would welcome owners of the Gorman exchange which was formerly Southwestern Bell property. The Gorman property will hereafter be known as the Gorman Telephone Company.

Michigan Association Selects H. R. Christianson

Selecting H. R. Christianson, general manager of the Michigan Associated Telephone Company, Muskegon, as president to succeed Dr. O. M. Vaughan, of South Haven, the Michigan Independent Telephone Association held their 2-day annual meeting at Lansing late in July. The attendance was gratifying despite unusually hot weather.

H. R. CHRISTIANSON
Selected to lead Michigan Independents.

The program was well received. The camaraderie of the Independents of Michigan is well known and found outlet at the pre-convention golf tournament and later at the annual banquet. Officers selected were: president, Mr. Christianson; vice president, Chas. W. Cheeney, Chesaning, and secretary-treasurer, Jane McNally.

Directors elected to serve were: Dr. Vaughan; W. J. Melchers, Owasso; Mr. Christianson; R. C. Smith, Homer; Mr. Cheeney; W. F. Bradstreet, Hudson; W. R. Stafford, Port Hope; B. R. Sage, Port Hope; Ernest Sprague, Lake City, and L. W. Reynolds, Octonagon.

Novel Emergency Ringing Machine

THE Junction Mutual Telephone Company of Grand Junction, Iowa, send us a description of a novel emergency ringing machine for use during failures of the commercial power supply, from which the regular ringing machines are operated.

This company purchased a water-motor at the small cost of $10.50 which was connected to a convenient faucet by a length of rubber hose and is belted to an ordinary hand generator. This arrangement has been in use for about ten years with complete satisfaction.

For others who may care to try this arrangement, pulley sizes should be selected which will provide a frequency of as near 20 cycles as possible. The regular bearings of the hand generator will not prove adequate for continuous operation but will ordinarily be satisfactory for use during the comparative short periods of commercial power failures in the average exchange for a period of several years. We know of one case where ringing power was obtained by belting an ordinary 5-bar hand generator, removed from a local battery telephone to an electric motor and which was run continuous for several months before the bearings on the generator gave out. Naturally this would not be possible except by keeping the bearings well lubricated.

The use of this makeshift ringing equipment is not advocated at this time when good, reliable ringing equipment is available at a reasonable cost. However, it is well to know the possibility of their use in case of emergency when regular equipment may not be available.

SPLICER'S TOOLS
Of Top Quality by UNIQUE

- FURNACES
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- BLOW TORCHES
- WIPING CLOTHS
- BALANCED LADLES
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- POLE BLEEDING TORCHES
- FOLDING SAFETY SHIELDS

Protect Public, Splicer, and Furnace. No. 50 C Shield shown here. Of 22 Ga. galvanized steel. Reinforced edges. 23"x17" x17". No. 50 — four-sided with grate. No. 50 A — same without grate.

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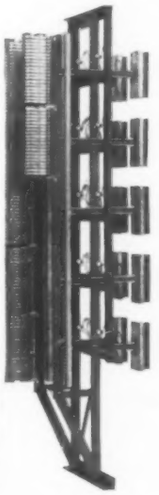

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Floor Frame

For Your New Floor or Wall Frames, Write Today for a Complete Description of COOK "L" TYPE MAIN DISTRIBUTING FRAMES

From a wide variety of floor and wall types, you can select exactly the frame you need. Cook Floor Type Main Frames are of steel construction, in sectional form, arranged for mounting any type of central office protector on the front and either vertical or horizontal line terminals on the rear.

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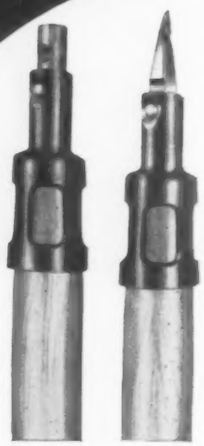


. . . CHANCE reversible point PIKE POLES

With this new pike pole your only replacement cost, when pike point becomes badly worn, is the cost of the point itself. No need to buy a complete new pole.

The spiral point on Chance Pike Poles may be removed by spring button release and replaced with a new point.

For extra safety in handling and carrying on the truck this point may be inserted point first as shown.

The Douglas fir poles are treated with pole preservative. This pike has steel point and malleable ferrule. Write or ask your jobber for more information.

ABC INDUSTRIES

A·B·CHANCE CO. CENTRALIA MISSOURI

"Tapping In" On Washington

(Continued from page 16)

vise work, are not now exempted from the hours provisions of the law. There were also a number of engineers with discretionary authority, although supervised, who should be classified as professional workers.

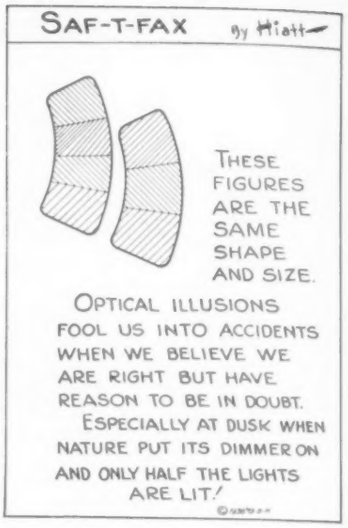
The Automatic Electric official proposed a definition that any person employed "in a responsible capacity doing work which requires discretion as distinguished from routine activities" with a salary of $37.50 a week or more should be exempted. He cited that the Automatic Electric and its affiliated companies employed around 2,800 persons of whom most were members of the International Brotherhood of Electrical Workers (AFL) and that while there was no desire to exempt "white collar" secretarial, clerical or accounting workers his companies desired to add another 146 administrative and professional employees to the 243 now already excluded from the Act.

The United States Independent Telephone Association through its Washington representative, William Bruckart (who died suddenly August 4) noted that it had proposed a definition for executive and administrative employees with the titles of executives, managers, officials, superintendents, foremen, department heads, supervisors, chief clerks and any assistants who take over the work of superiors during such relief periods and who earn $30 a week or more.

For the labor unions, the most interesting proposal was made by Paul E. Griffith, president of the National Federation of Telephone Workers—the independent telephone union with a membership of around two hundred thousand persons—who suggested to the Wage-Hour Division that many of the borderline classifications of employees could be handled by negotiations between the union and the management of the companies. He noted that the Wage Hour Division had in a number of cases given a special interpretation of the Fair Labor Standards Act as applied to particular industries without consulting labor unions. He stressed that exempted employees must be bona-fide executive, administrative or professional workers to insure the fair application of the Wage-Hour Law. The Federation also suggested that a supplementary code of regulations regarding the term "professional" as applied to the telephone industry could be developed through negotiations between the telephone companies and the union with the cooperation and approval of the Wage-Hour Administrator.

The IBEW opposed any redefinitions which would enlarge the classifications of employees exempted from the law. Most of the testimony by the AFL spokesman was general as applied to all utilities, but a proposal was made to remove telephone line foremen from the exempted employee group on the basis that they did not have the power to hire or fire or to direct jobs and were merely "skilled workers."

* * *


SAF-T-FAX by Hiatt
THESE FIGURES ARE THE SAME SHAPE AND SIZE.
OPTICAL ILLUSIONS FOOL US INTO ACCIDENTS WHEN WE BELIEVE WE ARE RIGHT BUT HAVE REASON TO BE IN DOUBT.
ESPECIALLY AT DUSK WHEN NATURE PUT ITS DIMMER ON AND ONLY HALF THE LIGHTS ARE LIT!

FCC Proposes Cost-Sharing Basis for Radiotelephone Service to Utilities' Repair Trucks

IN ORDER to restrict the scope of special emergency radiotelephone service to real emergencies and to prevent employment of such facilities for routine or common carrier business, the FCC has revised its rules and regulations dealing with this class of radiotelephone stations which have been established by all of the Bell System companies. The most important change in the FCC rules was in regard to the centralized radiotelephone service which has been planned by four Bell System companies to provide radiotelephone contact with repair trucks of telephone companies and other utilities. This FCC proposal was that regular message rates could not be filed for this service but that "contributions" to the telephone companies' capital and operating expenses by the subscribing utilities could be made on a cost-sharing basis. Contracts for such cooperative use and services would be approved by the FCC.

FCC Proposes Jurisdiction Over Interstate Interzone Rates in Kansas City Exchange Area

That the FCC is desirous of retaining as much regulatory jurisdiction over

the telephone industry as can be construed into the provisions of the Communications Act was indicated in the proposed finding, promulgated recently in connection with the filing of tariffs by the Southwestern Bell Telephone Co. covering interstate messages between zones in the Kansas City district exchange area.

The provisions of the Communications Act, although exchange service is expressly exempted, obviously were not intended to permit telephone carriers, subject to the FCC "by merely changing the label in the tariffs with respect to a particular class of service" to remove that service from the commission's jurisdiction. This pronouncement epitomized the basis for the FCC's ruling in this case which arose more than two years ago when the Southwestern Bell failed to file interstate rates for the Kansas City exchange area after it had enlarged that district to take in several suburban communities which had previously had interstate toll service between their areas and the two Kansas Cities.

The FCC started its investigations of this situation on July 29, 1938, and held a hearing in October, 1939. The question has been the subject of several conferences between the FCC, represented by Commissioner Paul A. Walker, and the Kansas and Missouri state Commissions, but it was noted in the FCC decision that the two state regulatory bodies did not participate in the findings.

Undoubtedly the issue regarding the filing of interstate interzone telephone rates in extended exchange areas with the FCC will be tested, it is believed, in the courts by the telephone companies and possibly with the aid of the state commissions because of its aspects of the enlargement of the FCC's powers. The next step, however, will be the filing of exceptions by the Southwestern Bell with the Communications Commission and a move for oral argument before the en banc Commission.

In its proposed finding, the FCC pointed out that prior to July 1, 1938, the Southwestern Bell had classified the telephone rates for these suburban communities adjacent to the two Kansas Cities under "message toll telephone service" in tariffs. But after that date with the expanded exchange area the same calls were handled under a classification, "interzone message service" and were only included in tariffs filed with the Kansas and Missouri commissions. "The only real change is a different label in a different tariff on the interzone calls handled on a message basis, "the FCC proposed report declared. The proposed finding added that the fact of the interzone interstate messages in the Kansas City area being "a negligible proportion of the revenues" did not affect the jurisdictional question.

* * *

Illinois Bell Undistributed Rate Refund Again Before U.S. Supreme Court

THE controverted question of the disposition of the $1,688,295 undistributed balance in rate refunds retained by the Illinois Bell Telephone Co. after the Chicago rate case has again bobbed up before the U. S. Supreme Court. This issue has been decided in two previous rulings by the nation's highest tribunal—once concerning a subscriber's plea to have it distributed among the known subscribers and in another case upholding the right of the telephone company to retain this balance.

The new case, a petition for a writ of certiorari, was brought to the Supreme Court by John Lackner, an Illinois Bell subscriber, who had lost in both lower courts the right to intervene in the rate case's final decree regarding the undistributed balance of refunds. Lackner also assailed the approval by the lower court of $1,500,000 to the telephone company for attorney fees.

The Illinois Bell in its brief emphasized that the public had been adequately represented in the rate investigation by the state commission and state attorney general and that courts had always held individual subscribers did not have the right to intervene in rate cases. The Illinois Bell cited that the Federal Court in its final rate decree had prescribed in detail the method and computation of refunds and a complicated system for the search of subscribers which the company had followed explicitly. The Illinois Bell brief also stressed that the Supreme Court had upheld the correctness of this method of rate refunding and the retention by the telephone company of the undistributed refund balance where subscribers had not been located.

Station Gain

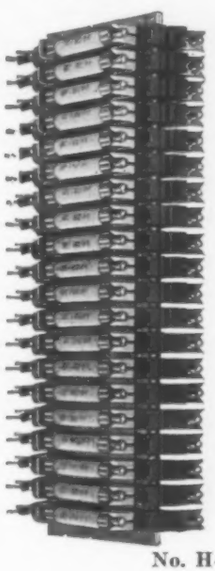
The principal operating subsidiaries in the American Telephone and Telegraph company system had a net gain of 22,000 telephones in service in July. This compares with a gain of 11,100 in July, 1939.

In the first seven months of this year the Bell system had a cumulative net gain of 471,000 telephones in service, compared with an increase of 381,000 units in the corresponding period a year ago.

THE BEST COMBINATION

for small Exchanges where heat coil protection is not required.

H-36 CENTRAL OFFICE PROTECTOR and the L-9 WALL FRAME



No. H-36

The H-36 Protector is built in 10 and 20 pair sections on metal plates and is equipped with terminals, fuses and lightning arresters. The L-9 Wall Frame has all the terminating and cross connecting features of the larger main distributing frames. Surprisingly low in price.

COOK
TERMINAL AND PROTECTION EQUIPMENT
COOK ELECTRIC CO.
2700 SOUTHPORT AVE. CHICAGO

Telephone Sold "By the Acre" In Georgia Community

FORSYTH, Ga., July 18 — They're selling telephones "by the acre here in the Georgia farm county."

By installing wires and equipment over a wide area, to a group of farms at one time, the Southern Bell Telephone and Telegraph company is cutting costs to the point where the average farmer can afford it.

An experiment in such "streamlining" has been taking place in Monroe county, and telephone officials, "More than well pleased" with results, plan to spend several million dollars to expand the idea in other rural areas.

The problem on country 'phone lines has been that sparse population requires a great outlay of material and time in comparison to the number of subscribers.

Mass installations were the natural solution, but would farmers "take to" telephones in sufficient numbers to make it practical?

Monroe county was picked as a testing ground because it is a Southern rural area average in population density, land contour, farm income, and the prevailing trend toward crop diversification and small farm industry.

Part of the economy of "streamlining" is in laying the 'phone wires in straight lines, to eliminate costs of bends and corners which require special bracing and guy cables and heavier poles.

The farmers here have not only given the company rights of way on their land to this, but have pitched and helped clear paths through their own woodland.

After less than four months of this experiment, there are 80 miles of new telephone lines, stretching as far as 14 miles from the Forsyth exchange: 100 new 'phones are tapped in.

These 'phones cost farmers who live within a four-mile radius of the exchange $1.50 a month. Those within six miles pay $1.75. The top, 14 miles, is $2.25.

Each 'phone is on an eight-party line, but the circuit is split into two parts so that each 'phone gets only four ring signals. Each has a modern handset 'phone on which the farmer dials his number.

The old rural rate on the bell system here was $1.50 a month plus 25 cents for each mile the farmer lived distant from town. That system had only seven subscribers. Popular dissatisfaction with it was evidenced by a line the farmers themselves built, hitched onto the Forsyth exchange and charged 50 cents a month flat rate. But the subscribers on that line were not pleased, either; they fell from 50 in 1925 to 15 in 1940.

Mr. Telephone Man:

In your town there are many installations of communication equipment that cannot be handled by telephone equipment. However, as the Communications Expert of your community, it should be your job to see that these needs are handled by you.

Two-Way Loud Speaking Equipment is available at economical cost that will take care of your problems of this nature and at the same time allow you a nice profit —either on monthly service fee or for cash sale.

We are the owners of the Patents on Two-Way Loud Speaking Equipment and ask that you write for our proposition. There is no obligation.

DUO-VOX
TWO-WAY LOUD SPEAKING TELEPHONES

Write for particulars.

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CHICAGO, ILL., U.S.A.
"Licensed under Bank Patent No. 1922415"

Thank You, George!

Scarbrough Bldg.
Telephone 3083
Austin, Texas
July 8, 1940

Mr. Ray W. Smith, Editor,
Telephone Engineer Publishing Corporation
7720 Sheridan Road, Chicago, Illinois

Dear Ray:

We have received and read with much interest the first issue of Fortnightly Telephone Engineer. You are certainly to be congratulated on this most worthwhile publication, and especially do we congratulate your good taste in beginning your first column with a news item of a fine Texan, Mr. R. B. Fairly. We believe these personals will add much interest to the reading matter of the Fortnightly.

We have enjoyed your first issue and wish you the best of luck with it.

Yours very truly,
George B. Butler

Fiji Islanders Now Have Radio Telephone Service

Communications systems in the Pacific have taken another stride forward with inauguration of wireless telephone service between the Fiji Islands and the New Caledonia-New Hebrides group. The first conversation on the system was held between Sir Harry Luke, governor of Fiji, and M. Pelicier, governor of New Caledonia and high commissioner for the New Hebrides.

UNINTERRUPTED SERVICE

with Non-Grounding Rare Gas Arresters

Used for many years by leading Railroads for vital Telephone, Telegraph and Signal Circuits.

Type MCD (illustrated) interchangeable with your present carbon block protectors.

Write for Catalog 39-A describing
Arresters Anti-Noise Relays
Terminal Strips Potheads Housings

L. S. BRACH Mfg. Corp.
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Signal Circuit Engineers Since 1906

25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of AUGUST, 1915

Twenty five years ago last July 24th was a tragic day for more than a thousand families in Chicago. 'Twas on that day that the pleasure boat Eastland sank in the Chicago river off State street, causing the death of 1,354 people, mostly employees of the Western Electric Company's Hawthorne plant, Chicago. The occasion was the annual outing of Western Electric employees.

▼

Arrangements were made whereby TELEPHONE ENGINEER was to print the bulletins of the National Association in lieu of a bulletin service issued by the Association to keep the members informed upon activities of the organization. W. S. Vivian was secretary at that time.

▼

In 1915 the burning issue before the Independents was "physical connection" with the Bell system. There was no uniform law governing this matter and the National Association fought for uniform action.

▼

Cumberland Valley Telephone Company of Harrisburgh, Pa., was reorganized. Property was operating under a bondholder's committee consisting of James Brady, John E. Fox, Henry W. Tracey, Charles A. Kunkel and William J. Lescure.

▼

Northern Indiana Association meets at LaPorte. Congressman Henry A. Barnhart of Rochester, J. C. Kelsey of Chicago and F. V. Newman of Grand Rapids were speakers. Sam Tomlinson of Plymouth, was president.

▼

C. W. Tucker was appointed Kansas City representative of the Kellogg Switchboard & Supply Co. Tucker received his training while manager of telephone properties in Kansas and Missouri.

▼

The uniting of the Orange Home Telephone Company exchange with the Southwestern Telephone & Telegraph Company at Waco, Texas, was proposed by officers E. C. Blomeyer and H. E. Kepler of the latter company at Orange recently.

Short Course in Telephone Transmission

(Continued from page 18)

mid point of the loop. Such a connection would create approximately 0.6 decibels loss. If the tap was only 2000 feet long, the loss would only be around 0.2 of a decibel. In speaking of the point at which the multiple cable bridges onto the loop cable, we mean the distance from the central office. The closer the multiple is to the central office the greater will be the transmission loss which results on the loop on which it is bridged. In general, in the smaller plants, there is little to worry about as the average tap is usually quite short compared to the loop length. For example, if we have a 2000 foot loop with 2000 foot tap located approximately 1000 feet from the office, the loss would be negligible.

In dealing with magneto lines, one must keep in mind that a bridged telephone introduces a loss to the line even though the receiver be on the hook. This is due to the fact that the bells take some current from the line. The magnitude of this loss for 1600 ohm ringers is generally taken as .07 decibels per telephone.

The central office loss is generally taken at 1.0 db which represents the cord circuit loss as well as the loss due to the capacity and resistance of the office wiring. In the small magneto offices it is doubtful whether the loss will be this high, probably being closer to 0.5 or 0.75 db.

Typical Losses on Subscriber Loops

IN a previous paragraph it was mentioned that in dealing with common battery subscribers loops that we must take into account not only the voice frequency loss in the cable but also the affect of cable resistance on the efficiency of the transmitting circuit of the common battery telephone. In the absence of the many charts that would be required to determine precisely what this loss would be for any given situation, let us look at a few typical examples so we may have some idea of the magnitude of such loss.

Take as a typical case a 24 volt common battery board, 24 gauge cable in the subscribers loop, and a common battery telephone of average efficiency. The transmitting loss (from curves) of a two mile 24 ga loop would be 9.4 db and the receiving loss 1.1 db. Now if we were to arrive at the transmitting loss merely by assuming that it was the same as the voice frequency loss, our answer would be greatly in error

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DESK STAND
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RINGER BOX
for $7.75
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inasmuch as 24 gauge cable has a loss of approximately 2.1 db per mile or 4.2 db for a 2 mile loop. From this it is evident that the **current supply loss** is an appreciable factor in determining the actual loss that will occur when one subscriber is talking to another through small gauge cable.

For another example, let us look at the transmission loss on let us say a common battery No. 109 iron line whose overall length is 10 miles. Again assuming a subset to be of average efficiency, the transmitting loss would be 12 db and the receiving loss of 2.4 db. This is based on a 24 volt common battery plant with a 109 iron loop. Computed on a purely voice frequency basis, we would say that the transmitting loss on a 10 mile iron line, would be only 3 db instead of 12 db. This should show the importance of taking all factors into account particularly in the design of new circuits or systems, as for example when a magneto to common battery change is contemplated. Inasmuch as a large part of this loss is due to the current supply loss, it is apparent that by changing from 24 to 48 volts that this loss can be greatly reduced. This is illustrated by the fact that on a 10 mile iron line the transmitting loss is only 8.4 decibels if we use a 48 volt central office battery as compared to the 24 volt battery.

TABLE No. 1

Transmission Equivalent Telephone Circuits and Apparatus

Item	Loss in db. at 1,000 cycles
Loop mile No. 109 iron wire	0.30
Loop mile No. 102 Copperweld wire	0.155
Loop mile No. 104 copper wire	0.068
Loop mile No. 24 gauge cable	2.10
Loop mile No. 22 gauge cable	1.75
Loop mile No. 19 gauge cable	1.20
Repeating Coils (modern type)	0.71
Loss due to eavesdropping subscriber (approx.)	3.00
Central Office cord circuit and wiring loss (common battery and magneto) (Approx.)	1.00
Loss due to a 600-ohm high resistance joint in one side of a telephone circuit (approx.)	3.80
Bridged loss to 1600 ohm ringer	0.07

Looking at curves for magneto service, let us take several examples, first on a 24 gauge loop, we find that with two miles of 24 gauge cable our loss is roughly 5.2 db in transmitting, and about 3 decibels on receiving. On an iron wire basis with an average magneto subset the transmitting loss would be 6 decibels for 10 miles of iron and the receiving loss about 4 decibels. These figures, when compared to straight high frequency losses should give some notion of the relationship between voice frequency loss and loss which takes into account current supply, as well as reflection affects between loops and central office equipment.

(TO BE CONTINUED)

Wife of Chas. E. Wells Succumbs to Heart Attack

Mrs. Anna Leota Wells, 62, wife of Chas. E. Wells, president of the Oregon Independent Telephone Association, died of a severe heart attack on July 8. She was president of the Hillsboro, Ore., City Council and a civic worker of many years service. She is survived by Mr. Wells and five sons.

Besides her services on the City Council, Mrs. Wells served on the local school board for a period of 20 years and was very active in lodge work. As a true telephone pioneer her death ended a 43-year period of service to that industry. Starting as operator and bookkeeper in 1897 with the Boone County (Iowa) Telephone Company. In 1898 she married Mr. Wells and together they served with over 6 different companies from Texas to Oregon. In 1914 she and Mr. Wells, having sold their Texas properties, moved to Oregon where she continued her career as cashier, secretary and operator of the Hillsboro Telephone Company until 1929 when the firm was sold to the Oregon Telephone Company. She then became vice president and auditor of the newly formed Northwest Telephone Company with head offices in Hillsboro and exchanges in five Oregon cities.

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—NOTICE—

Effective October 1, 1940 the subscription price of TELEPHONE ENGINEER, which also includes Fortnightly TELEPHONE ENGINEER will be increased to $1.50 per year.

PORTRAIT

I cheer the economic ideas that I do not grasp at all.

I applaud all the things that give me a headache ultimately.

I am always shouting for the forgotten man even down to the point where I discover bitterly that I top the list of the unremembered.

I argue in favor of new methods in government until I suddenly discover I am borrowing liver from the neighbors and wondering what that big lump on my head is.

★ ★ ★

I am suspicious of any man who has had pronounced success in his chosen field, who seems to take life seriously, and whose ideas are clear and understandable throughout his speech.

★ ★ ★

I think share-the-wealth programs are all right even after somebody has got most of everything I ever had.

I applaud as rescuers of America these wild-eyes, loud-voiced reformers in the news reel of whom I would be scared stiff if they ever lived in the same block with me.

I shout "Atta boy!" at radio speakers with a solution for all my problems when I know darned well that if anybody in my own family talked so cockeyed I would say "Scram! You're nuts."

★ ★ ★

I shrink in horror from what is happening in Germany, Italy and Russia, yet I am a push-over for every new voice in America.

I browbeat the wife if the grocery bill exceeds the budget or if she buys a $5 hat when I allowed her $3 for it, but I watch my country wallow in debt and merely chirp, "Everything will come out all right."

I read the headlines about the high taxes crippling industry and business, but I never read the details for fear I might be convinced.

I cheer the idea of a fight between the "haves" and the "have nots" but always toss into the waste basket any appeals for a small donation to the ophans' home.

I shout "Now you're talking" when some radio crackpot says there must be a more equitable distribution of the good things of life, but I hang up when somebody on the telephone asks me if I wish to give a dime to the organized charities drive.

I continue to vote for the person or principles responsible for devastating tax rates for years after I have seen the cost of everything from a pair of socks to a new auto tire soar to all-time high.

I lend an ear to tomfoolery of all kinds but walk out on a logical argument on the ground the speaker might be right.

I work two or three days a week harder than I ever worked in my life for less money and applaud the boys who say, "We must never go back to the old America!"

I have trouble supporting my family, I haven't had a new suit in two years and I never knew the soup to be so watery, but I don't throw anything at the radio when a voice shouts that we are "solving our economic problems and are founding a new America."

I am better off in this depression than my old man was in a slump, but I "think sumpin' oughta be done."

I have more comforts at the bottom of hard times than my grandpappy had when he thought everything was swell, but I am afraid there'll be a revolution if things don't get better soon.

I am the Average Middle-class American!

—*Anonymous*

On your lines this L-M Steel House Bracket will give you a typical example of the long service life you can expect of all L-M Telephone Construction specialties. Its fine, high-strength steel body is thoroughly galvanized. Its glazed porcelain insulators meet the industry's most exacting standards. Make a note now to try this L-M House Bracket . . . and to get the full facts on the complete line of L-M Pole Line Hardware and L-M Telephone Construction Specialties.

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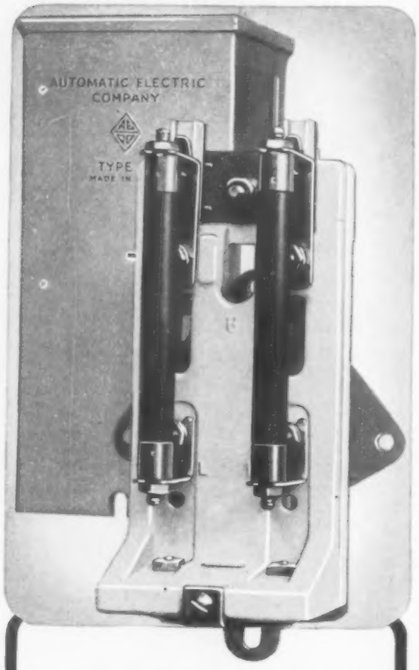

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ESTIMATING CONSTRUCTION COSTS

(Continued from page 21)

labor for all companies. Since the direct man hours are assumed to be the same for any given standard construction method for any given unit of plant under any given set of conditions it becomes necessary to adjust the loadings to accord with the experience of the company doing the work. This adjustment may assume the form of variations in the rate Per Cent. for certain loadings or may call for inclusion of some none-direct functions in some units of plant and their ommission from others. Otherwise the total estimated costs of some units of plant would be overstated and of some understated. It is worthy of note that this condition also might, by coincidence, develop a total estimated cost for the project which would accord with the total experienced total cost but which would be inaccurate for some of the specific units of plant.

The labor operations shown in the sample estimate for the 30 foot Creosoted Yellow Pine above are capable of further subdivision. In fact, in this case, the aim in the divisions of labor shown was to include one designation all the man hours that **were to be extended on the same weighted hourly rate of pay.**

The Material Cost

THE method of treating the material cost as shown in the sample estimate is obvious. The item of Construction Loss is necessary because of the shrinkage in the amount of almost any construction material between the amount that is purchased and the amount that ultimately finds its way into the plant. Suppose, for illustration, that the estimate covers the construction of a 30 foot Creosoted Yellow Pine pole lead containing 200 poles. Because of breakage, theft, and loss experience has shown that 202 poles would have to be purchased under the average conditions. This item of the material loading was originally called Damage, Loss and Shrinkage by the author, the more widely accepted term "Construction Loss" meaning just exactly that. In passing this item of material loading is a higher Per Cent. of the material in the case of wire, cable and conduit that it is in the case of poles. In other units of plant there are loadings that do not appear at all in connection with poles. Illustrations of such loading items are "Miscellaneous Material" and "Exempt Material." While the development of a schedule of labor relatives and of labor and material loadings is very tedious the final completion of such data places the engineer in possession of the key to estimating construction costs accurately and quickly under any and all conditions of organization, place, or labor rates. Estimates may be submitted for budgetary control with confidence and if the field records are properly compiled and final direct costs as shown by completed estimates carefully compared with the original estimates error in any of the related data will be gradually eliminated.

General Has Station Gain

General Telephone Corporation reports for its subsidiaries a gain of 1,465 company-owned telephones for the month of July, 1940 as compared with a gain of 1,219 telephones for the month of July, 1939. The gain for the first seven months of 1940 totals 16,240 (exclusive of purchases) or 3.24% as compared with a gain of 13,640 telephones or 2.96% for the corresponding period of 1939.

The subsidiaries now have in operation 518,561 company-owned telephones.

Asks Commission For Rate Increase

The Farmers Independent Telephone company of Red Cloud, Nebr., locally owned, asked authority of the Nebraska railway commission on July 29 to increase the rates charged at its exchange for switching calls from rural lines from 50 to 75 cents a month. The company says that it is subject to the wage and hour law of the federal government, and that this has increased the cost of service to the point where the 50 cent rate is not compensatory.

Mississippi Commission Seeks Revocation Order

Charges that the Magnolia Telephone Company, serving 20 towns in east and south Mississippi, has failed to give adequate service for several years will be heard by the Mississippi Public Service Commission August 16, when Attorney

General Greek Rice will seek to revoke the company's franchise.

The company will be required by the suit to show cause why its franchise should not be forfeited. Filed under provisions of senate bill 424, authored by Senator Evon Ford, of Taylorsville, and passed at the recent legislative session, the suit shows claims of Senator Ford and others that the company has failed to give the towns it serves adequate service for several years, its equipment was in a bad state of repair and the company has paid no taxes since 1933.

Should the commission declare the franchise forfeited, trustees will be appointed to sell the property.

The company has local exchanges at Ackerman, Baldwyn, Belmont, Brooksville, Byhalia, Calhoun City, Fulton, Guntown, Merigold, Olive Branch, Raleigh, Saltillo, Sherman, Taylorsville, Vardaman, Bezer, Pace, Sturgis, Florence and New Augusta. It also has local toll lines between Brooksville and Macon, Raleigh and Taylorsville, Taylorsville and Mt. Olive.

Change in Ownership

According to a press report, the Government has tentatively decided to exercise its option to acquire the telephone systems in Bombay, Calcutta and Madras during 1943. All three systems are now owned and operated by private companies, the largest of which the Bombay Telephone Company, operates in Bombay, Ahmedabad and Karachi. It is expected that the first step in the process of governmental acquisition will be the appointment of a special commission to determine the values of the telephone systems involved.

Bulgaria to Modernize Service

A bill has been introduced in Parliament authorizing credits in the amount of 400,000,000 leva ($4,000,000), to the Ministry of Communications for the development of Bulgarian communications. Most of this sum will be expended to modernize the telephone service throughout the country, such as the construction of interurban and toll circuits and the installation of automatic exchanges in the principal cities.

Place AT&T Network Under Extra Guard

The American Telephone & Telegraph Co. and its subsidiaries have placed their telephone communications network on a virtual war-time footing within the past six weeks.

Acting at the suggestion of National defense officials, precautions have been taken to protect vital operating centers, and added facilities are being set up to meet growing demands of preparedness activities.

An official of the A. T. & T.—explaining that the 24 operating companies of the Bell system have wide discretion in meeting local problems—said recently that these steps have been taken since a "defense meeting of company executives in June:

Extra guards have been posted at vital operating points. In a western district, guards were chosen from ex-marines who had been approved by the FBI.

Admission of visitors and unauthorized employes to telephone plants has been sharply restricted.

Photographing of plants and equipment has been forbidden.

Emergency power plant installations have been augmented, to insure unbroken operation.

In offices where formerly only women employees worked, work schedules have been altered to insure the presence of men 24 hours a day.

These men, in addition to their routine duties are charged with the responsibility of insuring that no unauthorized person enters the building. Some are armed.

Additional portable short wave radio equipment has been made available, to insure unbroken communication facilities if wires or wire equipment is sabotaged.

A questionnaire requesting detailed information "not hitherto felt necessary" about their citizenship was sent to 40,000 employes of the New York Telephone Co.

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Telephone in Use Set Record for Bell System

The principal operating subsidiaries in the American Telephone and Telegraph Company system had a net gain of 18,100 telephones in service in June, according to an announcement yesterday. This compares with a gain of 15,800 instruments in June, 1939. In the first six months of this year the Bell System had a cumulative gain of 449,000 telephones, against 370,000 correspondingly a year ago. At the end of June there were 16,984,600 telephones in operation in the Bell System, a new high record.

The New York Telephone Company, largest operating unit in the A. T. & T. group, reported a gain of 4,594 telephones in June, compared with an increase of 5,449 in June, a year ago. For the first half of this year the company had a gain of 61,581 units, against an increase of 54,743 in the first half of 1939.

IMPORTANT NOTICE!

The 1940 Pioneer roster will be closed for any additional new members September 5th. Those desiring to join the association write J. K. Johnston, Secretary, 632 Lemcke Bldg., Indianapolis, Ind. for application. 1940 shows a large increase in new members. Take advantage of this opportunity to become a Pioneer.

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Am. Auto Elec. Co. D. C. Type enclosed gong ringer straight line steel Hotel sets with No. 23 Dial @ 7.25

Am. Auto Elec. Off Center Base D. C. Desk set with No. 23 Dial & Straight line ringer steel Kellogg signal set @ 8.75

Kellogg No. 22 Transmitters Local or C. B. with back and Mouthpiece @ 1.10

Genuine Kellogg Type No. 2800 4-Bar 1000-1600 or 2500 ohm ringer Pony type compacts @ $9.25—lots of 10 ..... 8.75

American Elec. No. 696 4-bar 1000-1600 or 2500 ohm ringer Pony type compacts with Short Arm & Kellogg Trans. & Rec. @ $7.00—lots of 10 .... 6.50

Kellogg 3-bar hand Generators with Crank and Mtg. Screws @ 2.35

Western Elec. No. 50 3-bar Hand Generator with Crank & Mtg. Screws @ 2.75

Kellogg No. 729 S. A. Oak Central Battery hotel sets with Straight line ringer & Booster Coil @ 6.75

Stromberg-Carlson No. 988 desk set with 3-bar 1000-1600 or 2500 ohm ringer inside connection signal set @ $9.00 —4-bar $9.50—5-bar @ 10.75

Kellogg 50 line capacity magneto Swbd. with 50 drops and jacks equipped & 10 single supervision Cord Ckts. @ 200.00

REBUILT ELECTRIC EQUIPMENT CO.
1934 WEST 21st STREET
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Worden Exchange Changes Hands

The Illinois Commerce Commission has approved a contract by which the Worden Telephone Co. is to buy from Shelby J. Klingel for $2,500.00 all the properties of the Worden Telephone Exchange at Worden. The Company has also been granted a certificate of convenience and necessity to operate the system.

Robert A. Hill Named By John A. Roebling's Sons

John A. Roebling's Sons Company of Trenton, New Jersey announces the appointment of Robert A. (Bob) Hill as Branch Manager of the Southwest Territory, which now includes Texas, Oklahoma, Louisiana, Lower Mississippi and oil producing sections of New Mexico.

Robert A. Hill

He will have charge of sales and local stock of Roebling's complete line, which includes Wire Rope, Electrical Wires and Cables, Cold Rolled Flat Wire and Specialties, and Woven Wire Fabrics.

Mr. Hill is a native of the Southwest, worked his own way through Rice Institute, at the same time participating in athletics, and will make his headquarters in Houston. His previous business and technical experience totals nearly twenty years of association with the oil industry. Recently Mid-Continent Manager for Regan Forge and Engineering Company, he was previously Division Manager for Broderick and Bascom Wire Rope Company.

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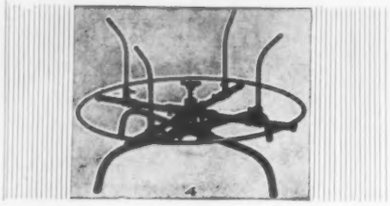

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Ready Wire Reels

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Adjustable Payout Tension
Adjustable Coil Size
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Low Cost

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Very light in weight, yet strong enough for heavy messenger. Made of malleable iron and steel.

Cost as low as $8.40. 30-day trial if desired. Five models. See Suttle Salesman Catalog, or write for special circular.

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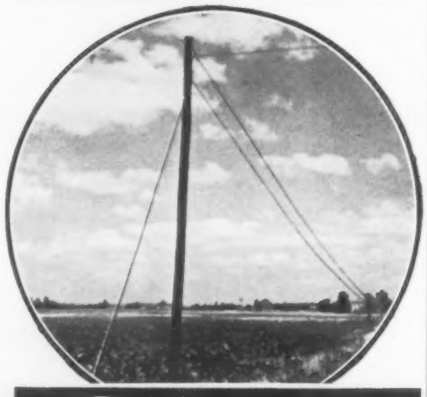

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Index to Advertisements

A

Acorn Insulated Wire Co..... 38
American Coach & Body..... —
American Steel & Wire Co..... —
American Tel. & Tel. Co.....8-9
Automatic Electric Co....24-25-34-39-42
Automatic Tel. & Elec. Co., Ltd..... —

B

Banks Mfg. Company..... 38
Barnard Co., B. S..... —
Bartlett Mfg. Co..... —
Berry, L. M..... 44
Brach, L. S. Mfg. Co..... 38
Buckeye Telephone Supply Co..... 45

C

Calculagraph Co..... 47
Carney & Company..... 44
Chance Co., A. B..... 36
Channel Splicing Machine..... —
Coffing Hoist Co..... —
Columbia Steel Co..... —
Commercial Cord & Supply Co..... 45
Communication Equipment & Engineering Co. ..... —
Cook Electric Co.....35-37
Copperweld Steel Co..... —

D

Davey Tree Expert Co..... —
Dillon, W. C & Company..... —
Dorson Corporation ..... —

E

Electric Storage Battery Co., The.. 11

F

Fansteel Metallurgical Corp'n..... —
Forged Steel Products Co..... —

G

Gardiner Metal Co..... —
General Cable Co..... 10
General Electric ..... —
Graybar Electric Co..... 13

H

Holtzer Cabot Electric Co..... —
Hubbard & Co..... —

I

Independent Tel. Repair Co..... —
Indiana Steel & Wire Co..... 46

J

Jackson Lumber Co..... —

K

Kearney Corp., Jas. R..... 40
Kellogg Switchboard & Supply Co. 5

L

Leich Sales Corp..... 3
Lenz Electric Mfg. Co..... —
Lincoln Hotel ..... —
Line Material Co..... 41
Loomis Advertising Co..... 44
Lorain Products Corp..... 6

N

National Carbon Co..... 14
National Telephone Supply Co..... 47
North Electric Mfg. Co..... 48

O

Oliver Iron & Steel Corp..... —
Owens-Illinois Glass Co..... —

P

Paine Company, The..... 6
Pearl, Wm. H..... —
Phillips Electric Works, Ltd..... —
H. K. Porter, Inc..... —

R

Raytheon Mfg. Co.....32-33
Ready Mfg. Co..... 44
Rebuilt Electric Equipment..... 45
Reliable Electric Co..... 27
John A. Roebling's Sons..... 43

S

Seymour Smith & Son..... —
Schauer Machine Co..... 44
Shallcross Mfg. Co..... —
Sherron Metallic Co..... —
Siemens Bros. & Co., Ltd..... —
Stromberg-Carlson Tel. Mfg. Co. 7-29
Suttle Equipment Co..... 46

T

Telkor, Inc. 13
Telephone Repair Co..... 45
Telephone Engineer 2

U

Unique Mfg. Co..... 35
Union Carbide & Carbon Co..... 14
U. S. Steel Corp..... —
U. S. Independent Tel. Assn..... —

V

Valentine & Clark Corp..... 44

W

Western Electric Co..... 31
Williams, Geo. E..... 44
Wopat, J. W..... 44
Wray, J. G. & Co..... 44